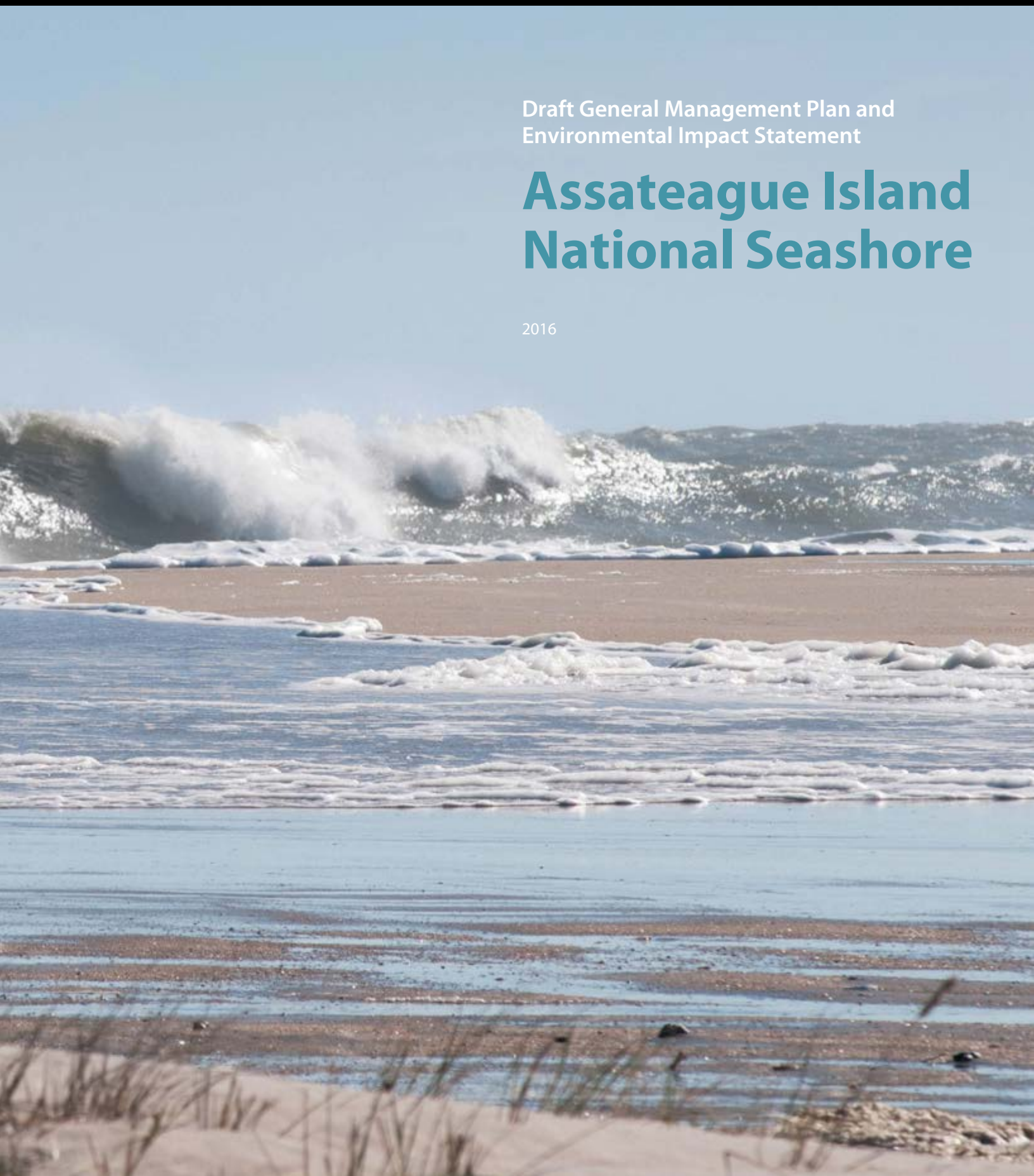
National Park Service
U.S. Department of the Interior



Draft General Management Plan and Environmental Impact Statement

# Assateague Island National Seashore

2016

**Photos by Allen Sklar**

Cover

Horse in Wetland (page xiii)

Beach and Dune (page 1-19)

Birds in the Water (page 1-21)

Fisherman (page 1-23)

Draft General Management Plan and
Environmental Impact Statement

# Assateague Island National Seashore

2016

**UNITED STATES DEPARTMENT OF THE INTERIOR**

**NATIONAL PARK SERVICE**

**DRAFT GENERAL MANAGEMENT PLAN/ENVIRONMENTAL IMPACT STATEMENT**

**Assateague Island National Seashore, Maryland and Virginia**

Assateague Island National Seashore (the seashore), established in 1965, preserves the outstanding Mid-Atlantic coastal resources of Assateague Island and its adjacent waters and the natural processes upon which they depend. The seashore also provides high quality resource-compatible recreation experiences. To support these purposes, the National Park Service (NPS) is preparing a new general management plan/environmental impact statement (GMP/EIS) for the seashore, to replace the seashore's existing GMP completed in 1982.

This GMP/EIS describes the continuation of current management alternative and three action alternatives for future management of the seashore, the environment that would be affected by the alternatives, and the environmental consequences of implementing the alternatives.

**Alternative 1.** The NPS would continue to manage resources and visitor uses as it does today. The seashore's enabling legislation and the existing *General Management Plan* (NPS 1982) would continue to guide seashore management. The NPS would manage seashore resources and visitor use as it does today, with no major change in direction.

**Alternative 2.** Most visitors would enjoy traditional beach recreation concentrated within a high density developed area accessible by private vehicle. This alternative would likely require significant manipulation of the natural environment to protect facilities and infrastructure in the island developed area. Outside the developed area, natural processes and the effects of climate change/sea level rise would be the primary forces influencing the condition and evolution of natural resources.

**Alternative 3 (NPS Preferred Alternative).** Over time, visitor use infrastructure would evolve to more sustainable designs and likely shift to more stable locations both on and off the island. Most recreational uses and activities would continue while new water-based points of access would provide access to additional low density visitor use in the seashore's backcountry. Natural processes and the effects of climate change/sea level rise would be the primary forces influencing the condition and evolution of natural resources. Alternative 3 represents a long-term shifting of seashore facilities and assets to adapt to climate change.

**Alternative 4.** Visitors would continue to use existing facilities and infrastructure until such time as they are lost and/or damaged by natural coastal processes and/or the effects of climate change/sea level rise. Lost or damaged facilities would either not be replaced or would be minimally replaced with sustainable substitutes. Visitor use would become almost entirely limited to day-use activities, although some primitive camping would remain available. Natural coastal processes and the effects of climate change/sea level rise would be the primary forces influencing the condition and evolution of natural resources. Alternative 4 represents a quicker adaptation of seashore facilities and assets to the effects of climate change, as the seashore shifts from a more traditional developed place to a more primitive place.

The GMP/EIS addresses the environmental impacts that would result from implementation of the alternatives. Impact topics include: water resources, vegetation, wildlife, federally listed threatened or endangered species, historic structures, cultural landscapes, seashore operations, access and circulation, visitor use and experience, and the socio-economic environment.

The NPS has distributed the GMP/EIS to other agencies and interested organizations and individuals for their review and comment. The public comment period for the GMP/EIS will last for 60 days after the U.S. Environmental Protection Agency publishes the notice of availability in the *Federal Register.*

# How to Comment on This Plan

The NPS welcomes comments on the GMP/EIS. Interested parties can submit commits to the NPS during the 60-day review and comment period, using one of the following three methods:

### Online: http://parkplanning.nps.gov/asis

We prefer that readers submit comments online through the park planning website identified above so that they become incorporated into the NPS Planning, Environment, and Public Comment System. An electronic public comment form is provided through this website.

### Mail

Superintendent
Assateague Island National Seashore
7206 National Seashore Lane
Berlin, MD 21811

### Hand Delivery

Comments can be dropped off at seashore headquarters (address above) or at public meetings, which will be announced in the media, following release of the GMP/EISA. Before including your address, telephone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment, including your personal identifying information, could be made publicly available at any time. Although you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

# Executive Summary

On September 21, 1965, Congress passed Public Law 89-195 (appendix A) establishing Assateague Island National Seashore as a unit of the national park system "for the purpose of protecting and developing Assateague Island in the states of Maryland and Virginia and certain adjacent waters and small marsh islands for public outdoor recreation use and enjoyment." With this, Assateague Island became a national resource serving the recreational needs of local regional, national, and international visitors and preserving in perpetuity 37 miles of Mid-Atlantic coastal environment.

## Seashore Boundary, Ownership, and Management Responsibilities

Assateague Island National Seashore encompasses Assateague Island and the adjoining waters of the Atlantic Ocean on the east and the estuarine waters of Sinepuxent and Chincoteague Bays on the east, extending up to one-half mile from the island. The seashore also includes approximately ten acres on the Maryland mainland, where seashore headquarters and the primary visitor center are located. All land on the island and mainland is in public ownership. The states of Maryland and Virginia own the submerged lands within the seashore boundary, with ownership extending to mean high water in Maryland and mean low water in Virginia.

### National Park Service

The National Park Service owns 8,983 acres within the seashore boundary, including land on Assateague Island in Maryland (exclusive of Assateague State Park), the Assateague Beach U.S. Coast Guard Station on the island in Virginia, and its mainland Maryland headquarters complex and visitor center. NPS manages approximately 22,393 acres of ocean and bay waters within the seashore boundary. The National Park Service (NPS) has prepared this *Draft General Management Plan/Environmental Impact Statement for Assateague Island National Seashore* (Draft GMP/EIS) to consider future management alternatives for the seashore lands and waters under its management.

### U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service (FWS) manages approximately 10,077 acres within the boundaries of Chincoteague National Wildlife Refuge (CNWR) on Assateague Island. FWS recently completed the *Chincoteague and Wallops Island National Wildlife Refuges Final Comprehensive Conservation Plan and Environmental Impact Statement (CCP/EIS)* (US FWS 20015) which provides the framework for future refuge management.

Assateague Island National Seashore

**Use of the Term "Seashore"**

The term "seashore" refers to the following:

- land owned and managed by the NPS within the authorized limits of Assateague Island National Seashore
- waters managed by the NPS within the authorized limits (including waters extending up to one-half mile from the island)

The term "seashore" does not refer to the following:

- land owned by the U.S. Fish and Wildlife Service (FWS) within Chincoteague National Wildlife Refuge
- land owned by the state of Maryland within Assateague State Park
- submerged lands within one-half mile from the island owned by the states of Maryland and Virginia

The term "Toms Cove Area" refers to the Virginia Assigned Area within Chincoteague National Wildlife Refuge where the NPS currently provides recreation facilities and interpretive programming through a memorandum of understanding (MOU) with the FWS (see section 1.3.2).

### Maryland Department of Natural Resources

The state of Maryland owns and manages lands within the boundaries of Assateague State Park, including 630 acres on the island and 220 acres on the mainland (MD DNR 2005). The Maryland Department of Natural Resources (MD DNR) manages the park in accordance with the *Assateague State Park Land Unit Plan* (MD DNR 2005).

## National Park Service Management at Assateague Island National Seashore

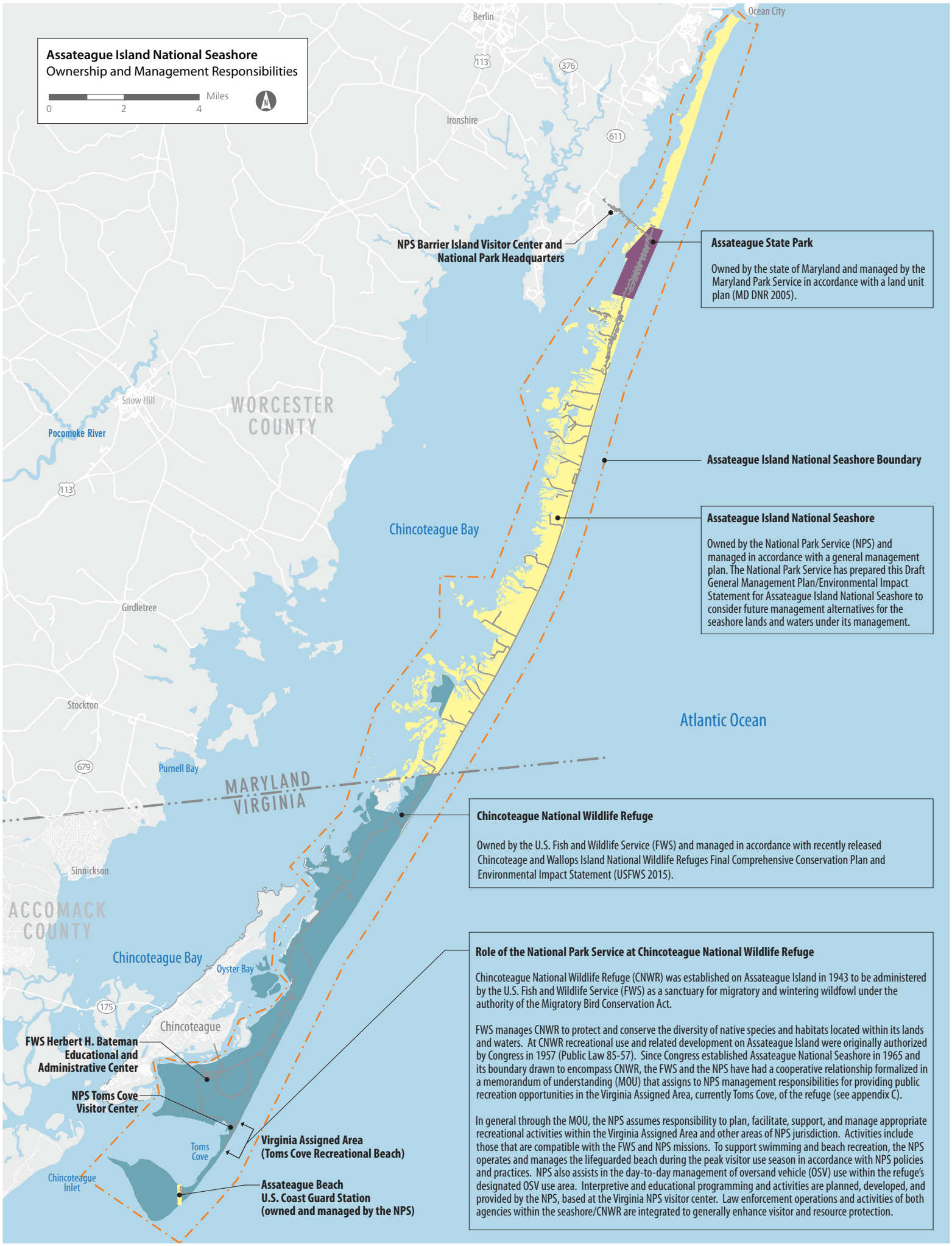
The NPS manages all units of the national park system in accordance with the mandate in its 1916 Organic Act and other legislation to conserve resources unimpaired for the enjoyment of future generations. To help implement this mandate, the National Parks and Recreation Act of 1978 (PL 95-265) and *NPS Management Policies* (NPS 2006c) require each park unit to have a broad-scale general management plan (GMP). The GMP defines the park's basic approaches to natural and cultural resource management, interpretation, the visitor experience, and partnerships over the long-term.

The NPS completed the first general management plan for Assateague Island National Seashore in 1982. Today – over thirty years later – the seashore needs a new GMP because issues and ideas have emerged in recent years that the 1982 GMP did not anticipate and so did not address. NPS has implemented many recommendations of the 1982 GMP, some recommendations are no longer appropriate because of changing conditions and circumstances, and funding limitations have prevented implementation of others. None of the recent NPS policies related to management and planning for all national park units are reflected in the 1982 GMP, notably those implementing NPS's climate change response strategy, which are critical to management of a national seashore.

The new GMP/EIS will provide a decision-making framework that ensures that management decisions effectively and efficiently carry out the NPS mission at Assateague Island National Seashore.

## Planning Challenges Facing the National Park Service at the Seashore

General management planning offers a structured decision-making process that encourages and considers ideas and comments from many different people and groups. Throughout development of the GMP/EIS, the NPS planning team used a variety of scoping techniques to identify the issues related to management of the seashore, the range of management alternatives that should be considered in the GMP/EIS to address those issues, and the range and nature of impacts that should be used to evaluate and compare alternative management actions. Scoping occurred internally with NPS staff and externally with other public agencies, partner organizations, and interested citizens. Five categories of planning issues emerged from this process.


Assateague Island National Seashore
Ownership and Management Responsibilities
Miles
0
2
4
Berlin
Ocean City
113
376
Ironshire
611
NPS Barrier Island Visitor Center and National Park Headquarters
Assateague State Park
Owned by the state of Maryland and managed by the Maryland Park Service in accordance with a land unit plan (MD DNR 2005).
Snow Hill
WORCESTER COUNTY
Pocomoke River
113
Assateague Island National Seashore Boundary
Chincoteague Bay
Assateague Island National Seashore
Owned by the National Park Service (NPS) and managed in accordance with a general management plan. The National Park Service has prepared this Draft General Management Plan/Environmental Impact Statement for Assateague Island National Seashore to consider future management alternatives for the seashore lands and waters under its management.
Girdletree
Stockton
Atlantic Ocean
679
Purnell Bay
MARYLAND
VIRGINIA
Chincoteague National Wildlife Refuge
Owned by the U.S. Fish and Wildlife Service (FWS) and managed in accordance with recently released Chincoteage and Wallops Island National Wildlife Refuges Final Comprehensive Conservation Plan and Environmental Impact Statement (USFWS 2015).
Sinnickson
ACCOMACK COUNTY
Chincoteague Bay
Oyster Bay
175
Chincoteague
FWS Herbert H. Bateman Educational and Administrative Center
NPS Toms Cove Visitor Center
Virginia Assigned Area (Toms Cove Recreational Beach)
Toms Cove
Chincoteague Inlet
Assateague Beach U.S. Coast Guard Station (owned and managed by the NPS)
Role of the National Park Service at Chincoteague National Wildlife Refuge
Chincoteague National Wildlife Refuge (CNWR) was established on Assateague Island in 1943 to be administered by the U.S. Fish and Wildlife Service (FWS) as a sanctuary for migratory and wintering wildfowl under the authority of the Migratory Bird Conservation Act.
FWS manages CNWR to protect and conserve the diversity of native species and habitats located within its lands and waters. At CNWR recreational use and related development on Assateague Island were originally authorized by Congress in 1957 (Public Law 85-57). Since Congress established Assateague National Seashore in 1965 and its boundary drawn to encompass CNWR, the FWS and the NPS have had a cooperative relationship formalized in a memorandum of understanding (MOU) that assigns to NPS management responsibilities for providing public recreation opportunities in the Virginia Assigned Area, currently Toms Cove, of the refuge (see appendix C).
In general through the MOU, the NPS assumes responsibility to plan, facilitate, support, and manage appropriate recreational activities within the Virginia Assigned Area and other areas of NPS jurisdiction. Activities include those that are compatible with the FWS and NPS missions. To support swimming and beach recreation, the NPS operates and manages the lifeguarded beach during the peak visitor use season in accordance with NPS policies and practices. NPS also assists in the day-to-day management of oversand vehicle (OSV) use within the refuge's designated OSV use area. Interpretive and educational programming and activities are planned, developed, and provided by the NPS, based at the Virginia NPS visitor center. Law enforcement operations and activities of both agencies within the seashore/CNWR are integrated to generally enhance visitor and resource protection.

### Natural Coastal Processes and Effects of Climate Change/Sea Level Rise

Natural coastal processes including the action of tides, wind, waves, currents, and sea level rise continually influence and shape Assateague Island. In response to sea level rise, the island is slowly moving westward through storm overwash and inlet formation processes. Most island changes occur during intense storm events which – while lasting only a few days – can dramatically alter the physical characteristics of the island and bay. As global climate change intensifies, the rate of sea level rise and the intensity of coastal storms will likely increase and accelerate the rate and magnitude of island changes. The GMP/EIS addresses the following questions related to natural coastal processes and the effects of climate change/sea level rise.

- *How will the NPS respond to global climate change/sea level rise impacts on the seashore?*

The natural environment of the seashore is expected to become less stable under most global climate change/sea level rise projections. Driven by higher rates of sea level rise, more intense and possibly more frequent storms, rising temperatures, changes in precipitation patterns and drought, the island will likely experience significant changes in its physical form, the type and condition of habitats, and the diversity of species. While the pace and magnitude of climate change remains uncertain, it is clear that the

consequences of even low-end projections will compound existing threats to seashore resources and challenge the NPS's ability to fulfill the seashore's mission.

- *To what extent will the NPS continue to provide permanent visitor facilities on the island given the dynamic nature of the island and the continuous need for public investment to maintain those facilities?*

Because Assateague Island is an exceptionally dynamic landform, all infrastructure and developed visitor facilities are ultimately at risk of damage or loss. At present, the management response to this challenge varies, ranging from rebuilding facilities after storm damage – as is the general policy in the seashore's Maryland District – to minimization of permanent structures combined with use of temporary/seasonal structures that are removed from the island before major storms – as is the policy in the seashore's Virginia District. In light of the high potential for accelerating rates of sea level rise due to global climate change, maintaining these facilities over time will require repeated and likely more frequent public investment for repairs and reconstruction, and might not be sustainable.

- *What should the NPS do if major storms create breaches in the island that limit access?*

Most global climate change scenarios indicate that barrier islands such as Assateague Island will become much more dynamic as a result of accelerating rates of sea level rise, and more intense and possibly more frequent storms. The formation of breaches and new inlets during storm events has occurred repeatedly on Assateague, and is very likely to occur again. Depending upon the location, future breaches or new inlets might render portions of the island's backcountry largely inaccessible by traditional means and might also have an effect on nonfederal lands and coastal communities.

### Visitor Use and Visitor Experience

The seashore is one of the few publicly accessible coastal environments in the densely populated northeast United States where visitors can experience unspoiled beaches, tranquil bays and marshlands, natural sounds, quiet, dark night skies, and solitude. Most visitors to the island seek an easily accessible beach experience where they can be near the ocean, sit in the sun, swim, fish, beachcomb, and play. Most visitors want to see the wild horses. A majority of visitors typically do not seek out the many other opportunities for natural resource appreciation offered at the seashore, although some hunt and shellfish or paddle the back bays. The GMP/EIS addresses the following questions related to visitor use and visitor experience.

- *What safe and sustainable alternative strategies should be used to enhance visitor access to the island?*

**Alternative Transportation Strategies for Access from MD 611.** Existing roads and parking facilities do not meet current visitor demand and cannot be expanded without significant resource damage and loss. During the busy summer season, visitors who arrive by automobile sometimes experience delays entering the seashore and reaching their desired destination. The NPS has completed an alternative transportation study to explore options for addressing the transportation problems. Potential options are likely to include improved traffic information systems to alert visitors of congestion before they enter the seashore, the use of mass transit from satellite parking facilities on the mainland, and relocation of the entrance stations for the seashore and Assateague State Park to a joint facility on the mainland. A joint entrance station could not be operated without changes to the state legislation which authorized the bridge and which prohibits tolls. In the absence of a legislative change, the NPS would have to assume ownership of the bridge and its associated maintenance in order to collect entrance fees on the mainland. In all cases, the development of alternative solutions to transportation problems in the Maryland District will require collaborative planning with Maryland DNR for Assateague State Park.

- *What outdoor recreation opportunities should be available to visitors as natural coastal processes and/or the effects of climate change/sea level rise reshape Assateague Island and alter access to seashore facilities?*

**Location and Types of Visitor Facilities**. As natural coastal processes and/or the effects of climate change/sea level rise reshape Assateague Island, the maintenance of the current circulation system and the location of protected beaches, campgrounds, and other facilities on the island are likely to change. In concert with questions of visitor facilities and visitor access described above, consideration must be given to how to support the desired range of outdoor recreational opportunities.

**Oversand Vehicle Use (OSV).** Access to a more remote beach experience via four-wheel drive vehicle in the OSV use area is one of the seashore's popular visitor activities. During summer, the demand for access to the seashore's designated OSV use area frequently exceeds the 145 vehicle capacity, forcing visitors to wait in line for long periods before space becomes available. Once getting into the OSV use area, most visitors stay within the first few miles of beach, leaving much of the remaining route available for the enjoyment of a relatively small number of visitors. Changes to the island as a result of sea level rise could change the location and extent of this experience.

## Partnerships

Three government agencies manage Assateague Island: the Maryland Department of Natural Resources (MD DNR), the US Fish and Wildlife Service (FWS), and the NPS. The seashore relies on the actions of surrounding communities to address regional traffic and congestion, protect water quality, and augment emergency services. Additional opportunities exist for partnerships that would help the NPS better protect resources, enhance the visitor experience, increase operational efficiencies, expand youth outreach programs, and reach additional underserved audiences. The GMP addresses the following question related to partnerships.

- *How should the NPS work cooperatively with its neighbors and public agencies at all levels of government to protect Assateague Island's resources from the adverse effects of land uses and activities both outside and within the seashore's boundaries?*

The park's neighbors and public agencies at all level of governments routinely engage in activities that directly and indirectly impact Assateague Island's resources and the experiences that visitors have in the park. Likewise, the actions that NPS undertakes at the seashore can have an impact on other agencies and nearby communities.

## Wilderness

The *Assateague Island Wilderness Study* (NPS and FWS 1974) and subsequent study revisions determined that 5,200 acres qualified for federal wilderness designation pursuant to the Wilderness Act. Based upon findings from these studies, President Gerald Ford recommended to Congress that 440 acres be immediately designated as wilderness and that the remaining 4,760 acres be classified as "potential wilderness" to become eligible when non-conforming backcountry development and uses were

eliminated. A bill recommending creation of the Assateague wilderness was introduced in Congress but no action was taken.

The seashore's 1982 GMP recommended that wilderness designation be reconsidered when the physical remnants of former development were removed. As part of the seashore's current planning process, the NPS is required to make a determination concerning how these areas will be managed to protect and enhance wilderness character. The GMP/EIS addresses the following question related to wilderness.

- *How should the Assateague backcountry be managed to protect wilderness character while allowing for compatible recreation and NPS operational needs?*

### Cultural Resources

The seashore contains a variety of locally, regionally, and nationally significant cultural resources. These resources, as well as their associated documents and objects, are all that remain from the relatively brief periods when humans have occupied Assateague Island. They provide important links to both the history and purpose of the seashore. Two resources – the former Assateague Beach U.S. Coast Guard Station and the former Green Run Lodge – are eligible for listing the *National Register of Historic Places*. There are significant gaps in the seashore's understanding of and ability to protect and interpret these resources. The Assateague Beach U.S. Coast Guard Station sits vacant and underutilized due to problems with access. Other issues include a backlog of archival materials needing assessment, cataloging, and conservation, and the absence of archeological survey data for most of the island. The GMP/EIS addresses the following question related to cultural resource management.

- *How should the seashore's cultural resources be managed?*

## Management Alternatives

In crafting the management alternatives for the seashore, the GMP/EIS planning team chose to consider climate change and sea level rise as key factors influencing the future of the seashore. While there is uncertainty about the future pace of climate change and sea level rise, there is near consensus among the scientific community that change is underway. Any plan for the future of the seashore must consider the management challenges associated with an increasingly dynamic island landform. This approach is consistent with recent Department of the Interior and NPS policy which calls for incorporation of climate change considerations and response in all levels of planning.

The GMP/EIS alternatives explore options to provide and protect visitor use and recreational opportunities on Assateague Island and seek new approaches to providing sustainable access and infrastructure. Barrier islands such as Assateague will be especially vulnerable to the effects of climate change and sea level rise, and NPS must be able to respond effectively. Although major impacts are not expected in the near term, now is the time to set the stage so that future managers have the options available when conditions and circumstances do change. In the GMP/EIS alternatives seashore managers have explored options, such as constructing roads and parking lots out of native materials, mobile facilities, relocation of infrastructure onto the adjacent mainland, and shuttle and ferry services to the seashore.

Note that any proposed new visitor facilities development, rehabilitation, or post-storm reconstruction described below would be undertaken only after appropriate climate change and sea level rise risk assessments have been completed. A more detailed examination of these factors would influence the type, design, location, and ultimate feasibility of any proposed project.

## Alternative 1: Continuation of Current Management

### Concept

The NPS would continue to manage seashore resources and visitor use as it does today, with no major change in scope or direction. The seashore's enabling legislation, the existing *General Management Plan* (NPS 1982b), and other implementation plans would continue to guide management decision-making. Decisions would be based on existing conditions and available information, but would continue to lack a comprehensive planning framework that addresses the full range of contemporary and potential future issues. Natural coastal processes would continue with minimal interference. Response to breaches and/or new inlet formation would be uncertain, determined on a case-by-case basis taking into consideration laws governing the seashore and a variety of factors such as human safety and protection of property. Dune maintenance in the island developed area in Maryland and other limited actions would protect facilities from storm damage. Visitor use facilities and infrastructure at risk of loss would be moved back from the shoreline. Improvements to visitor facilities and seashore operational facilities would include only projects that are already approved and fully-funded, or compatible with the current direction of seashore management. Altered sand transport processes at Ocean City Inlet would continue to be mitigated through the North End

Restoration Program. There would continue to be no systematic response to climate change.

In Virginia, the NPS would continue to support beach-oriented recreational uses in the Island developed area within the Chincoteague National Wildlife Refuge.

**Visitor Use and Visitor Experience**

Existing interpretive, educational, and management programs providing a range of services to visitors would continue. The two visitor centers would continue to provide orientation, information, interpretive programs, and exhibits and serve as both destination and points of departure for day visitors, bus tours, school groups, and campers. Traditional ranger-led activities and curriculum-based educational programs would continue to be available. Programs would continue to emphasize the interpretive themes, with climate change issues presented on a limited basis.

Visitors would continue to enjoy a variety of traditional beach-oriented recreational activities concentrated within the Maryland developed visitor area. The NPS would continue to support beach oriented recreational activities in the Island developed area through its memorandum of understanding with the FWS. The availability of recreation opportunities could change as natural coastal processes and the effects of climate change/sea level rise continue to re-shape the island and damage facilities; limited actions would be taken to reclaim lost land area, to replace facilities, or to further protect recreational resources.

Opportunities for driving on the beach in Maryland would continue within the seashore's existing designated OSV use area with minimal or no management changes. As long as access exists, there would be no change in the use limit of 145 vehicles. If a breach occurs, the response would be uncertain, determined on a case-by-case basis.

The seashore's public hunting program would continue to be managed for its recreational values and as a resource management tool to control non-native species. Most hunting, fishing, and recreational shellfishing would continue in accordance with state and federal laws.

**Seashore Facilities and Operations in Maryland**

Existing visitor facilities and infrastructure would continue to have varying degrees of sustainability. Decisions regarding the repair and/or replacement of damaged facilities and infrastructure would generally be based on available funding. To the extent possible they would be repaired or replaced at or near their current locations. Existing facility management, law enforcement, visitor service, administrative, and resource protection operations would continue largely unchanged.

**Natural Resource Management**

Existing natural resource management programs would continue, many in partnership with federal, state, and local agencies, academic institutions, and non-governmental organizations. Programs would focus on protecting sensitive species, monitoring resource conditions, mitigating external threats, controlling non-native species, and restoring habitats impacted by man-made structures or activities. The feral horse population would continue to be actively managed with contraceptives to achieve and maintain a stable population of 80 to 100 horses. Hunting would continue to help control white-tailed deer and sika deer. Certain types of unauthorized commercial fishing activities – such as the harvest of finfish and horseshoe crabs – would continue to occur within the seashore without intervention by the NPS. Continued cooperative research directed toward management issues would provide improved understanding of seashore resources and ecological processes. There would be no action related to privately owned structures (oyster watch houses and hunting blinds) associated with submerged land leases in Chincoteague Bay within the seashore boundary. The NPS would continue to partner with the USACE to implement the North End Restoration Project that mitigates the continuing effects of the Ocean City Inlet and jetties.

**Wilderness**

The NPS would continue to protect and enhance the wilderness character of the potential and recommended Assateague wilderness through actions to eliminate incompatible features and activities. There would be no change in the size or location of the potential and recommended wilderness.

**Cultural Resource Management**

Existing programs providing basic protection to the seashore's cultural resources would continue consistent with applicable federal and state laws and regulations, NPS policies, adopted NPS plans for the seashore, and NPS guidelines for the treatment of historic structures likely to be affected by climate change. Maintenance of *National Register* eligible properties (the former Assateague Beach U.S. Coast Guard Station and the former Green Run Lodge) would continue, subject to the availability of funding. Limited dune stabilization would protect the Assateague Beach U.S. Coast Guard Station from natural coastal processes and/or the effects of climate change/sea level rise.

**Partnerships**

Existing partnerships and cooperative relationships that support ongoing management would continue. Key partners would be the MD DNR at Assateague State Park and the FWS at Chincoteague National Wildlife Refuge.

**Land Acquisition**

No land acquisition would occur.

## Actions Common to the Alternatives 2, 3 and 4

The following section identifies management actions common to the three action alternatives, including management zoning, desired conditions, and specific management actions. These common actions are in addition to the actions described for each alternative below. Note that all planned and programmed projects included in alternative 1 are also included in and are common to the action alternatives.

### Community Resilience

The NPS would work in cooperation with other federal agencies, the states, counties and communities to explore how best to model the impacts of sea level rise and storm surge. These efforts would evaluate potential effects of breach management, modifications to infrastructure and other related actions on local communities and infrastructure. Together, stakeholders would explore ways to mitigate hazards and increase the resiliency of surrounding communities and infrastructure.

The NPS would develop a breach management plan to guide its response to future breaches on the island. The plan would specify the conditions under which the NPS would allow breaches to remain open or would allow breach closures. It would be based on the best science available and conform to the mission of the NPS and laws governing the seashore. It would also consider other important elements such as

human safety and protection of property. While completion of a breach management plan would be common to alternatives 2, 3, and 4, the protocols for responding to breaches would differ, reflecting the specific climate change adaptation philosophy inherent in each alternative

**Natural Resource Management**

As in alternative 1, existing natural resource related practices and programs would initially continue. The primary emphasis of resource management actions would remain directed towards protecting sensitive species, monitoring resource conditions, mitigating external threats, controlling invasive plant and animal species, and restoring habitats impacted by historic land use. Over time natural resource protection programs would diminish or expand in alternatives 2, 3, or 4. The NPS would continue to partner with the USACE to implement the North End Restoration Project that mitigates the continuing effects of the Ocean City Inlet and jetties by restoring/maintaining sand supply to northern Assateague Island at the historic, pre-Ocean City inlet rate.

**Marine Resource Management**

NPS would collaborate with the states of Maryland and Virginia and local communities to protect a unique working marine landscape and way of life and to protect seashore resources. The following recommendations are consistent with current NPS policy, expand opportunities to research and understand natural resource conditions and the cultural heritage associated with the seashore's marine environment, and open up avenues for constructive conversation about these management activities going forward. These include:

- Working collaboratively to undertake studies to better understand the natural and cultural resources within the marine areas of the seashore.
- The states of Virginia and Maryland would continue to manage shellfishing within the seashore.
- NPS would issue a special use permit under 36 CFR 2.60(3)b to the Virginia Marine Resource Commission (VMRC) within the Commonwealth of Virginia to allow for the continued practice of commercial aquaculture and maintenance of the historic setting.
- NPS would prohibit the harvest of horseshoe crabs as currently proposed by the USFWS' final Comprehensive Conservation Plan.
- NPS would collaborate with local and regional cultural and academic institutions to develop interpretive programming and other visitor information that would illuminate the cultural heritage of the eastern shore and Assateague Island.

**Wilderness**

The NPS would undertake an assessment of eligibility and prepare a new wilderness study. Potential and recommended wilderness would be generally managed to preserve, restore, and enhance natural ecological conditions and wilderness qualities while providing limited opportunities for low density, low impact primitive recreational experiences. NPS would implement a long-term monitoring program to assess the conditions and trend of wilderness character over time based on the "keeping it wild" framework, adapted for the individual characteristics of the Assateague Island Wilderness.

**Visitor Use and Visitor Experience in Maryland**

Recreational uses and activities in the island developed area would be maintained in all the alternatives. However, over time the facilities and infrastructure supporting those uses would change as natural coastal processes and the impacts of climate change/sea level rise continue to re-shape the island and damage facilities. How facilities and infrastructure that support recreational uses and activities evolve would vary depending upon the coastal response management framework in alternatives 2, 3, and 4.

Until such time as facilities are lost or damaged, in alternatives 2, 3, and 4 NPS would expand the types and number of commercial services supporting visitor use within the island developed area in Maryland.

The NPS would also periodically review regulations pertaining to OSV use at the seashore (36 CFR§7.65(b)) and make amendments if conditions render changes necessary.

**Visitor Use and Visitor Experience in Virginia**

The NPS would continue to support beach-oriented recreational uses in the island developed area within Chincoteague National Wildlife Refuge in Virginia. NPS would continue to manage the recreational beach in accordance with the memorandum of understanding between the NPS and the FWS (see appendix B). The Final CCP/EIS's preferred alternative supports continuation of the recreational beach with 961 automobile parking spaces to be managed by the NPS (US FWS 2015, page 2-51). The Final CCP/EISs preferred alternative finds that, "In recognition of the vulnerability of the current parking, the refuge would develop and implement a site design plan for parking and access to a new beach location, approximately 1.5 miles north of the existing beach... The new recreational beach would offer accessible parking in close proximity to the beach". (US FWS 2015, page 2-51)

The Final CCP/EIS's preferred alternative proposes that the transition to the new recreational beach location would occur within eight years or sooner if funding were available (US FWS 2015, page 2-69). In the meantime, NPS would maintain beach

recreation and parking at the current location, so long as the land base is available to support this use. Facilities and infrastructure supporting recreation include access roads and parking lots, shade shelters, rest rooms, changing rooms, rinse off showers, and interpretive programs. Until the beach moves, NPS would maintain the Toms Cove Visitor Center. When the beach location is moved northward, a new joint NPS and FWS visitor contact station would be developed. (US FWS 2015, page 2-51). After the new joint visitor contact station is opened, NPS and FWS may continue to operate environmental education programs from the Toms Cove Visitor Center, as long as that center remains serviceable and can be maintained economically. Eventually the current Toms Cove Visitor Center will be removed when it is no longer possible to maintain it in the face of sea level rise.

NPS would work with the FWS, the town of Chincoteague, Accomack County and others to design the new recreational beach sensitively, to respond to both the natural environment and the needs of the area's visitors. The beach experience, while different from that at the current location, would be designed to engage visitors and provide the kind of recreational opportunity for which the region has justifiably become famous. Careful attention to the design of parking for cars, RVs and buses, boardwalks, accessibility, changing stalls, rinse-off facilities, vault toilets, shelter areas, and other related needs would ensure a quality experience at the new beach location. The Final CCP/EIS's preferred alternative also proposes management of biting insects to help ensure a positive visitor experience (US FWS 2015, page 2-70). Critical to the success of the new design will be finding an appropriate balance between visitor experience and resiliency from future storms.

The relocation of the recreational beach might change the availability and mix of interpretive opportunities provided by NPS. NPS would work with FWS in the new joint visitor facility to provide appropriate and meaningful interpretive activities for visitors that take full advantage of the new location and the new preferred alternatives for Beach Road Terminus and Toms Cove Bay.

OSV use in Virginia would be as determined by the FWS. FWS proposes to develop a new ½ mile OSV zone to facilitate priority wildlife-dependent uses south of the new recreational beach from March 15 through September 15. FWS would continue current management of the Overwash and Hook area for shorebirds until the new recreational beach is established, at which time the March 15 through September 15 closure would go into effect. OSV access from September 16 to March 14 annually would continue via Beach Road. NPS would cooperate with FWS to provide OSV access.

**Seashore Facilities and Operations in Maryland**

The NPS and MD DNR would explore the potential for a consolidated, jointly operated entrance station to Assateague Island located on the mainland. This would provide efficiencies, better manage the number of vehicles accessing the island, achieve shared

resource and visitor use management objectives, and facilitate operation of a shuttle system.

Existing automobile-based access to the seashore would continue as long as it remains sustainable in the context of natural coastal processes and/or the effects of climate change/sea level rise. On peak days – once parking capacity is reached – the seashore would close to additional vehicles. For visitors still wanting to get to the seashore in Maryland, a mainland-based commercial shuttle would be available. Visitors would park near the visitor center on the mainland and ride the shuttle to the beach and other attractions on the island. Over time as parking capacity on the island is reduced as a result of natural coastal processes and/or climate change/sea level rise, shuttle facilities on the mainland would expand to support a larger shuttle operation providing additional parking to meet growing demand and offering more frequent service with more shuttle vehicles.

### Alternative 2: Concentrated Traditional Beach Recreation

**Concept**

Most visitors to the seashore would enjoy traditional beach recreation concentrated within a high density island developed area in Maryland accessible by private vehicle. Artificial dune fortification, habitat manipulations, and possibly beach nourishment would protect the island developed area from the natural coastal processes and/or the effects of climate change/sea level rise as long as a suitable land base exists and funding is available. Over time, the island developed area would likely be consolidated in response to the increasing challenge of protecting facilities from sea level rise and greater storm intensity. Increased crowding could lead to visitor use limits. Increased fees could be needed to offset the higher cost of providing visitor facilities. Breach management protocols would generally seek to repair storm overwash and breaches in the island developed area in Maryland, and to let the island's backcountry areas evolve naturally – without interference – subject to the full effects of natural coastal processes and/or climate change/sea level rise.

In Virginia, the NPS would continue to support beach-oriented recreational uses in the island developed area within Chincoteague National Wildlife Refuge (see actions common to alternatives 2, 3 and 4 – Visitor Use and Visitor Experience in Virginia).

**Visitor Use and Visitor Experience**

The seashore's two visitor centers would continue to provide orientation, information, interpretive programs, and exhibits and would serve as both destination and departure points for day visitors, bus tours, school groups, and campers. Interpretive and environmental education programming would be based on the seashore's interpretive themes but would increasingly focus on recreation, orientation, information, and safety.

Traditional recreational uses and activities in the island developed visitor area in Maryland would be maintained on the island as long as suitable land base exists and funding is available. Expanded commercial services, additional lifeguards, and campground facilities with more amenities would enhance the visitor experience. Current recreational uses in the backcountry and in adjacent waters would continue but with minimal additional investment in facilities to support those uses. High density visitor use at the north end of the island would not be allowed. Most hunting, fishing, and recreational shellfishing would continue in accordance with state and federal laws.

As long as access exists, opportunities for driving on the beach in Maryland would continue but within a smaller designated OSV use area limited to the area outside of the potential and recommended wilderness (south of developed visitor area to approximately KM 23.4). If vehicular access to the OSV use area is lost due to natural coastal processes or the effects of climate change/sea level rise (e.g., a persistent breach occurs in the OSV use area and the breach management plan calls for it to stay open), no action would be taken to restore it and access could be further reduced or eliminated.

The risk to continued visitor use and enjoyment of the seashore under this alternative would be high. Should fortification of the island developed area in Maryland ultimately prove impracticable and/or should funding not be available to repair damaged or lost facilities, the seashore could become inaccessible to visitors for months to years following major storm events.

**Seashore Facilities and Operations in Maryland**

Over time visitor facilities and infrastructure such as developed campgrounds, beach parking, restrooms, and changing areas would be concentrated within a smaller developed area and fortified to withstand the impacts of natural coastal processes and climate change/sea level rise. New facilities could be developed to enhance recreational opportunities, such as a campground store or restaurant. Beach parking, RV camping, and other improvements would continue to be accessible via private vehicle. A mainland based commercial shuttle would provide access once island parking capacity is reached.

Most administrative and maintenance functions would be based in rehabilitated facilities in their current location at the seashore's Maryland headquarters complex. The NPS would seek to acquire property in the general vicinity of the headquarters

complex for use for alternative transportation parking. A combined ranger station/campground office and small maintenance yard would remain on the island.

**Natural Resource Management**

Programs and actions to protect and manage the seashore's most significant natural resources would continue. The emphasis of resource management actions would remain directed towards protecting sensitive species, monitoring resource conditions, mitigating external threats, controlling invasive plant and animal species, and restoring habitats impacted by historic land use. Over time, some resource management programs and activities would likely diminish as funding and staffing are re-directed towards the protection of recreational opportunities and visitor use management.

**Wilderness**

The NPS would continue to protect and enhance the wilderness character of the potential and recommended Assateague wilderness through actions to eliminate incompatible features and activities. There would be no change in the size or location of the potential and recommended wilderness.

**Cultural Resource Management**

NPS would not maintain the former Assateague Beach U.S. Coast Guard Station and the former Green Run Lodge. No actions would be taken to protect the structures and cultural landscape from natural coastal processes and/or the effects of climate change/sea level rise. If it is determined that the historic structures and cultural landscape have become so damaged by coastal storms, sea level rise, or other climate change related issues that they create a hazard, NPS would document the resources in accordance with the *Secretary of the Interior's Standards* (NPS 1995c) and other NPS policies, guidelines, and standards. Then NPS would likely demolish the structures and rehabilitate the sites to foster a return to natural conditions.

**Partnerships**

Existing partnerships and cooperative relationships that support seashore management would continue. As actions to fortify and protect the island developed area in Maryland become more complex, the NPS would expand its existing partnership with the U.S. Army Corps of Engineers (USACE) related to island erosion control. Partnerships with tourism and recreation interests would likely expand, particularly those with new commercial service providers active in the island developed area in Maryland.

**Land Acquisition**

The NPS would seek to acquire land (approximately 10 acres) in the vicinity of the Maryland headquarters complex for development of an ATS system.

## Alternative 3: Sustainable Recreation and Climate Change Adaptation (NPS Preferred Alternative)

### Concept

Climate change adaptation would play an increasingly important role in seashore management. Over time, natural coastal processes and/or the effects of climate change/sea level rise are expected to become the dominant force shaping the character of the island developed area in Maryland. To minimize or avoid the damaging effects of natural coastal processes and/or climate change/sea level rise, visitor use infrastructure would evolve to more sustainable designs and likely shift to new, more stable locations. Some manipulations of the natural environment would be necessary to sustain recreation opportunities but would be kept to the minimum needed. This would include limited maintenance of the existing artificial dune system as facilities and infrastructure transition to more sustainable designs. Breach management protocols would seek a reasonable balance that would generally let the island evolve naturally subject to the effects of natural coastal processes and/or climate change/sea level rise while taking into consideration needs for human safety and protection of property. Impacts to natural sand transport processes from the jetty-stabilized Ocean City Inlet would continue to be mitigated. Planning and development of alternative transportation systems including shuttles, ferries, and new bayside access along Chincoteague Bay would prepare the seashore for possible loss of traditional land access. Overall, visitors

would enjoy expanded opportunities for sustainable recreation throughout the seashore due to additional access points throughout the seashore.

In Virginia, the NPS would continue to support beach-oriented recreational uses in the island developed area within Chincoteague National Wildlife Refuge (see actions common to alternatives 2, 3 and 4 – Visitor Use and Visitor Experience in Virginia).

**Visitor Use and Visitor Experience**

The seashore's two visitor centers would continue to provide orientation and information but would increasingly become centers of learning emphasizing resource stewardship, sustainability, climate change threats and adaptation, and seashore resource management issues. Traditional ranger led programs and environmental education would be guided by the interpretive themes as well as the special emphasis issues, and would continue to stress activities and experiences that promote resource stewardship and opportunities for in-depth learning. As new points of departure are developed (ferry terminal, shuttle staging areas, Chincoteague Bay public access sites) these areas would provide new opportunities for visitor contact, orientation, safety messaging, and seashore information.

Most recreational uses and activities in the Maryland portion of the seashore would be maintained on the island although, over time, the facilities and infrastructure supporting those uses would evolve towards greater sustainability. Some recreational activities, such as RV camping, could eventually be relocated to the mainland.

New bayside access points would provide expanded opportunities for sustainable recreation in the backcountry. Public hunting, visitor shellfishing, and recreational finfishing would continue as currently managed although if land-based access to the backcountry is altered due to natural coastal processes or the effects of climate change/sea level rise, hunting access to some portions of the seashore could become more difficult. Most hunting, fishing, and recreational shellfishing would continue in accordance with state and federal laws.

Opportunities for driving on the beach in Maryland would continue within the seashore's existing OSV use area until conditions change. OSV use would be managed for maximum flexibility to respond to changing conditions, protect sensitive resources, and minimize conflicts with other seashore uses. If vehicular access to the OSV use area is lost due to natural coastal processes or the effects of climate change/sea level rise (e.g., a persistent breach occurs in the OSV use area and the breach management plan calls for it to stay open), consideration would be given to modifying the route or relocating it to another more suitable location; however the OSV use area would always be located east of the winter high tide mark.

The risk to continued visitor use at the seashore would be low under this alternative. Adaptive management and contingency planning – including development of alternative means of accessing the island – would reduce the potential for the seashore to become inaccessible to visitors following major storm events.

**Seashore Facilities and Operations in Maryland**

Over time visitor use facilities and infrastructure would evolve in design and could shift to new, more sustainable locations on the island. For example, some or all the Oceanside RV campground could be moved to the more stable bayside causeway area. Initially beach parking, RV camping, and other improvements would continue to be accessible by private vehicle.

When no longer sustainable on the island, some facilities and infrastructure would move to the mainland. A mainland-based commercial shuttle would provide access once parking capacity is reached. More visitors would access the island by water, using a network of new public access sites on the mainland and along the length of the seashore's bay side. Should the bridge to the Maryland portion of the island be damaged or fail or if there was a breach that prevented use of private vehicles, access to the island would shift to a fully water-based system composed of a new passenger ferry and the network of new public access sites.

Most administrative and maintenance functions would be relocated to another mainland location to allow development of a shuttle/ferry parking facility at the current headquarters site. A combined ranger station/campground office would remain on the island, although it would be replaced with a moveable facility once the existing permanent structure is no longer sustainable.

**Natural Resource Management**

Natural resource protection programs would expand and the scope of some existing programs would change to address the increasingly complex resource management issues created by global climate change/sea level rise. Programs would focus on enhancing the resiliency of resources vulnerable to climate change effects, monitoring key climate drivers and resource conditions, and improving the sustainability of visitor use and seashore operations. Cooperative research would expand, accelerating growth in the understanding of seashore resources and ecological processes.

**Wilderness**

An assessment of eligibility would be undertaken and a new wilderness study would address three proposals related to the OSV corridor and administrative access to the backcountry:

- Consider moving the eastern boundary of the proposed wilderness area westward from the mean high water line of the Atlantic Ocean to a line approximately 50 meters west of the ocean beach winter storm berm, to allow OSV use on the beach below the winter storm berm and on the two cross island sand roads (from KM 16 to the state line).
- Consider excluding the two existing public cross-island bay access sand roads at Fox Hills and Big Levels and the access road to Green Run from the wilderness area. Some operational access would be needed to maintain backcountry campground restrooms but seashore staff would look to find ways to minimize the access need.
- Consider establishing an administrative area within the vicinity of Green Run Bay, to include the Green Run backcountry campsite, the former Green Run Hunting Lodge property, and the associated access road.

**Cultural Resource Management**

NPS would protect and maintain the former Assateague Beach U.S. Coast Guard Station and Green Run Lodge in situ as long as possible with improvements, subject to availability of funding. Adaptive reuse of both properties would provide additional protection. At the station, non-structural storm protection features, such as bayside stabilization, would protect the property from natural coastal processes and/or the effects of climate change/sea level rise. If it is determined that the historic structures and cultural landscape have become so damaged by coastal storms, sea level rise, or other climate change related issues that they create a hazard, NPS would document the resources in accordance with the *Secretary of the Interior's Standards* (NPS 1995c) and other NPS policies, guidelines, and standards. Then NPS would likely demolish the structures and rehabilitate the sites to foster a return to natural conditions.

**Partnerships**

Existing partnerships and cooperative relationships that support ongoing management would continue. Partnerships would likely expand with Assateague State Park and Chincoteague National Wildlife Refuge as cooperative solutions are developed to address natural coastal processes and/or the effects of climate change/sea level rise. Partnership activity with the scientific and educational communities would expand with efforts to enhance resource resiliency and climate change adaptation. If recreational amenities move from the island to the Maryland mainland, new partnerships with Worcester County and adjacent landowners would be required. Relationships with commercial service providers would also expand with new alternative transportation systems and efforts to improve accessibility to the backcountry.

**Land Acquisition**

The NPS would seek to acquire land in the general vicinity of the Maryland headquarters complex sufficient to support the relocation of the administrative and maintenance facilities, some island facilities, and transportation infrastructure (20 to 200 acres). Relocation of the headquarters complex would make available the existing site as a base of operations for a future alternative transportation system. New land that could be acquired could also be used to support the relocation of some island facilities and infrastructure away from vulnerable areas if and when the need arises, and to protect the scenic character of visitor routes to the new sites. The NPS would collaborate with MD DNR to explore options for using state-owned property and/or acquiring new lands for two new points of departure on the mainland near the state park and current NPS developed area for a future ferry system and new shared fee booths. NPS would also support partner and/or direct NPS development of one to three points of departure on the mainland for mid-island access (150 to 200 acres). To the extent possible, NPS would collaborate with federal, state, and county partners to develop these mainland access points, with direct NPS development occurring if partnership development is not feasible.

Additionally, NPS would support partner groups who seek to acquire various types of legal interests in lands within the Chincoteague Bay watershed for conservation and climate change adaptation purposes (3,000 to 5,000 acres). NPS would collaborate with other federal, state, and county agencies and non-governmental organizations, including the FWS, to protect these lands.

### Alternative 4: Natural Island Evolution and a Primitive Island Experience

**Concept**

Natural evolution of the island would occur without interference and subject to the full effects of natural coastal processes and climate change/sea level rise. Breach management protocols would generally seek to let the island evolve naturally. Impacts to natural sand transport processes from the jetty-stabilized Ocean City Inlet would continue to be mitigated. Existing visitor use facilities and infrastructure would remain in the island developed area in Maryland until such time as they are lost and/or damaged by natural coastal processes or become obsolete. In response to the threat from climate change/sea level rise, minimal future investments would be made on the Maryland portion of the island, limited to development and maintenance of sustainable, low impact day-use facilities and primitive camping infrastructure. Planning and development of an alternative transportation system including a passenger ferry from the mainland would prepare the seashore for possible loss of traditional land access. Over time visitor use would shift to primarily day-use activities in a more primitive island setting. More emphasis would be placed on the role of the seashore as a protected natural environment and living laboratory for scientific research and study.

In Virginia, the NPS would continue to support beach-oriented recreational uses in the Island developed area within Chincoteague National Wildlife Refuge (see actions common to alternatives 2, 3 and 4 – Visitor Use and Visitor Experience in Virginia).

**Visitor Use and Visitor Experience**

The seashore's two visitor centers would continue to provide orientation, information, interpretive programs, and exhibits. Traditional ranger-led activities and curriculum-based environmental education programs would also continue, but the location of activities in Maryland would gradually shift away from the island as access becomes less automobile based. While the seashore's interpretive themes would continue to provide a basic foundation for programming, increasing emphasis would be on issues related to climate change and the role of the seashore as a protected natural environment and living laboratory.

Over time visitor use in the Maryland portion of the seashore would transition to almost exclusive day-use, with the experience becomingly increasingly primitive. Some existing recreational opportunities, such as developed area RV camping, would eventually be phased out. Public hunting would continue as currently managed, although if land-based access to the backcountry is altered due to natural coastal processes or the effects of climate change/sea level rise, hunting access to some portions of the seashore could become more difficult. Most hunting, fishing, and recreational shellfishing would continue in accordance with state and federal laws.

Opportunities for driving on the Maryland beach would continue within the seashore's existing OSV use area. If vehicular access to the OSV use area is lost due to natural coastal processes or the effects of climate change/sea level rise (e.g., a persistent breach occurs in the OSV use area and the breach management plan calls for it to stay open), then the OSV use area would be reduced or eliminated. Contingency planning – including development of alternative means of accessing the island – would reduce the potential for the seashore to become inaccessible to visitors following major storm events.

**Seashore Facilities and Operations in Maryland**

Over time visitor use facilities and infrastructure would remain until they are lost or damaged by natural coastal processes and/or the effects of climate change and sea level rise. Ultimately visitor use facilities would support only day-use recreation. If existing roadways and parking facilities are lost or damaged, they would not be repaired, replaced, or relocated. Instead a mainland-based commercial shuttle would provide access. Should the bridge to the island be damaged or fail, access to the island would shift to a fully water-based system composed of a new passenger ferry and water-based access offered by commercial service providers operating from existing public access sites on the mainland.

Most administrative and maintenance functions would relocate to another mainland location to allow development of a shuttle/ferry parking facility at the current headquarters site. A combined ranger station/campground office would remain on the island, although it would be replaced with a smaller moveable facility once the existing permanent structure is no longer sustainable.

**Natural Resource Management**

Natural resource protection programs would expand as the seashore emphasizes resource preservation and its role as a natural laboratory for scientific research and study. New programs would focus on mitigating human impacts and climate change adaptation, including actions to enhance the resiliency of vulnerable resources, monitoring key climate drivers and resource conditions, and enhancing the sustainability of seashore operations. Cooperative research would expand to include a broader agenda of basic science and research into barrier island ecology and the effects of climate change/sea level rise on coastal ecosystems.

**Wilderness**

An assessment of eligibility would be undertaken and a new wilderness study would address two proposals related to the OSV corridor and administrative access to the backcountry:

- Consider moving the eastern boundary of the proposed wilderness area westward from the mean high water line of the Atlantic Ocean to a line approximately 50 meters west of the ocean beach winter storm berm, to allow OSV use on the beach below the winter storm berm and on the two cross island sand roads (from KM 16 to the state line.)
- Consider excluding the two existing public cross-island bay access sand roads at Fox Hills and Big Levels and the access road to Green Run from the wilderness area. Some operational access would be needed to maintain backcountry campground restrooms but seashore staff would look to find ways to minimize the access need.

**Cultural Resource Management**

NPS would protect and maintain the Assateague Beach U.S. Coast Guard Station and Green Run Lodge in situ as long as possible, subject to availability of funding. At the station, limited dune stabilization and/or bayside stabilization would protect the property from natural coastal processes and/or the effects of climate change/sea level rise. Adaptive reuse of Green Run Lodge would provide additional protection. If it is determined that the historic structures and cultural landscape have become so damaged by coastal storms, sea level rise, or other climate change related issues that they create a hazard, NPS would document the resources in accordance with the *Secretary of the Interior's Standards* (NPS 1995c) and other NPS policies, guidelines, and

standards. The NPS would likely demolish the structures and rehabilitate the sites to foster a return to natural conditions.

**Partnerships**

Existing partnerships and cooperative relationships that support ongoing management would continue. Partnership activity with the academic and educational communities would expand with efforts to stimulate scientific research and utilize the seashore as a natural laboratory. As traditional means of access are lost and alternative transportation systems are introduced, partnerships with commercial service providers would expand.

**Land Acquisition**

The NPS would seek to acquire land (up to 25 acres) in the general vicinity of the Maryland headquarters complex sufficient to support the relocation of administrative and maintenance facilities. Relocation of the headquarters complex would make available the existing site as a base of operations for a future alternative transportation system.

Additionally, NPS would support partner groups who seek to acquire various types of legal interests in lands within the Chincoteague Bay watershed for conservation and climate change adaptation purposes (3,000 to 5,000 acres). NPS would collaborate with other federal, state, and county agencies and non-governmental organizations, including the FWS, to protect these lands.

### Seashore Boundary

The NPS will continue to work with the Department of the Interior's Office of the Solicitor to assess options to resolve boundary issues associated with the changing location of the island's shoreline.

As included in the NPS preferred alternative (alternative 3), NPS would seek an increase in the in the seashore's authorized ceiling for acquiring interests in land (fee simple and easements) on the mainland in Worcester County, Maryland, for purposes of the following:

- addressing operational and management issues (enabling acquisition of from 20 to 200 acres for relocation of the seashore's headquarters complex, some relocated island facilities and infrastructure, and new public access sites for island transportation)
- enhancing public enjoyment related to the purposes of the seashore (enabling acquisition of from 150 to 200 acres to establish one to three mainland points of departure that would provide alternative access sites for the mid-island area if needed as a result of sea level rise – this could consist of direct acquisition of sites, or partnership acquisition of buffer areas to protect these access points from the effects of climate change)

## Affected Environment and Environmental Consequences of the Alternatives

Chapter 3 of the Draft GMP/EIS describes the affected natural, cultural, and socio-economic environment within and near the seashore. Chapter 4 describes the predicted impacts on the environment associated with the four GMP/EIS alternatives. Impact topics include water resources, vegetation, wildlife, federally listed threatened and endangered species, historic structures, cultural landscapes, seashore operations, access and circulation, visitor use and experience, and the socio-economic environment. The impact analysis describes direct, indirect, and cumulative impacts, and discusses the importance of impacts in the context of the affected resource. Analyses involved comparing conditions that would occur with changes in management (alternatives 2, 3, and 4) to conditions that would occur if current management practices continued (alternative 1). The results are presented in table 2.14 of the GMP/EIS and are summarized for selected impact topics below.

### Impacts of Alternative 1: Continuation of Current Management

#### Water Resources

Natural resource management actions and rehabilitation of habitats altered by historic land uses and mosquito ditches would continue to restore natural surface and groundwater flows, improve wetland values, slightly enhance floodplain functions, and minimally reduce flood potentials. Nutrient discharges to nearby waters would be reduced due to improved wastewater treatment. Potential for contamination of nearby waters would continue due to motorboat use, OSV use, other visitor activities, and routine seashore operations. Replacement of damaged facilities and construction of new facilities could result in minimal sediment discharges to nearby waters.

#### Vegetation

Natural resource management actions would continue to rehabilitate habitats altered by historic land uses, mosquito ditches, and invasive *Phragmites australis.* Management of feral horse and deer populations would continue to reduce trampling and overgrazing of vegetation. The North End Restoration Project and continuation of programs to restore natural overwash fans would restore habitats in beach and intertidal areas. Trampling and loss of vegetation by visitors would continue where recreational uses are concentrated, particularly within the island developed area in Maryland. Replacement of damaged facilities and construction of new facilities could result in minimal loss of vegetation.

**Wildlife**

Natural resource management actions would continue to benefit wildlife by rehabilitating habitats altered by historic land uses, mosquito ditches, and invasive *Phragmites australis.* Management of feral horse and deer populations would continue to benefit wildlife by reducing trampling and overgrazing of vegetation. The North End Restoration Project and continuation of programs to restore natural overwash fans would restore habitats in beach and intertidal areas. Trampling and loss of habitat by visitors would continue where recreational uses are concentrated, particularly within the island developed area in Maryland. Replacement of damaged facilities and construction of new facilities could result in minimal loss wildlife habitat. Horseshoe crab harvest would continue to directly contribute to a decline of spawning horseshoe crabs in the Toms Cove area (US FWS 2015).

**Federally Listed Threatened or Endangered Species**

Management actions would generally have beneficial impacts on the federally listed (threatened) piping plover (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*). Management of feral horse and deer populations would continue to benefit the two listed species by reducing trampling and overgrazing of vegetation in beach and intertidal areas where the species are known to occur. The North End Restoration

Project and continuation of programs to restore natural overwash fans would also maintain and/or restore beach and intertidal areas. Potential trampling and other types of disturbances by visitors would continue where recreational uses occur within portions of the OSV use area and in the north end; management actions would continue to seek to minimize these impacts through area closures and other measures, especially during times of the year when plover nesting occurs and young are present. If there is a breach, an adverse impact to listed species could occur because management of horse and deer herds and other measures to protect listed species could become more difficult to implement due to loss of vehicular access; conversely, if there is a breach, a beneficial impact to listed species could occur because the potential for visitor use disturbances could be reduced due to loss of vehicular access to beach and intertidal areas where the species occur.

**Historic Structures**

Continued maintenance would have beneficial impacts on the seashore's historic structures that are eligible for the *National Register* at the former Assateague Beach U.S. Coast Guard Station and the former Green Run Lodge. Limited actions to protect eligible historic structures from natural coastal processes and/or the effects of climate change/sea level rise would also have beneficial impacts. Eventually historic structures would likely be significantly damaged or lost. Before then, historic structures would be documented in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (NPS 1995c).

**Cultural Landscapes**

Continued maintenance would have beneficial impacts on the *National Register* eligible cultural landscape at the former Assateague Beach U.S. Coast Guard Station. Limited actions to protect the eligible cultural landscape from natural coastal processes and/or the effects of climate change/sea level rise would also have beneficial impacts. Eventually the cultural landscape would likely be significantly damaged or lost. Before then, the cultural landscape would be documented in accordance with the *Secretary of the Interior's Standards* (NPS 1995c).

**Seashore Operations**

Minimal operational efficiencies would be gained as a result of initial actions to rehabilitate the seashore headquarters complex. Existing partnerships and volunteer programs would continue to facilitate some functions to protect seashore resources and provide recreational opportunities.

Seashore facilities would continue to be exposed to very high risk and uncertainty of becoming abruptly inaccessible in the event of a catastrophic storm, with the result that the seashore would be unable to operate without vehicular access.

**Access and Circulation**

Serious congestion would remain within the island developed area in Maryland on summer weekends because access management actions would not address chronic access issues.

Due to a lack of a contingency plan for responding to catastrophic storms and the effects of climate change/sea level rise, transportation infrastructure would remain in non-sustainable locations subject to recurring damage and eventual loss as the island's land area continues to shrink. There would be very high risk and uncertainty of the seashore becoming abruptly inaccessible in the event of a catastrophic storm. The seashore could become inaccessible to visitors for months to years.

**Visitor use and Visitor Experience**

Visitor use and visitor experience at the seashore would continue as it is today, as long as there is vehicular access to the seashore. Serious congestion within the Island developed area in Maryland on summer weekends would continue to adversely impact the visitor experience; actions would not be taken to reduce congestion. OSV use would continue within the existing OSV use area; if access to the OSV use area is lost due to a breach, it is possible that opportunities for driving on the beach and associated recreation activities would be lost, as relocation of the OSV use area would not be considered.

Due to lack of a contingency plan for responding to catastrophic storms and the effects of climate change/sea level rise, opportunities for visitors to experience the seashore would be at very high risk of being lost; opportunities for visitors could be lost for months to years.

**Socio-economic Environment**

Continued seashore visitation with associated visitor spending, job creation, labor income and value added would continue to benefit the local economy. When vehicular access is lost, lack of contingency planning would make the island inaccessible to visitors for months to years; visitor spending would drop to approximately five percent of its previous levels with similar drops in job creation, labor income, and value added to the local economy; there would be uncertainty as to when visitor access and associated economic benefits could be restored.

NPS would continue to not enforce existing federal laws prohibiting horseshoe crab harvest, resulting in a beneficial impact to some commercial watermen.

## Impacts of Alternative 2: Concentrated Traditional Beach Recreation

### Water Resources

As in alternative 1, natural resource management actions and rehabilitation of habitats altered by historic land uses and mosquito ditches would continue to restore natural surface and groundwater flows, improve wetland values, slightly enhance floodplain functions, and minimally reduce flood potentials; however, in alternative 2, the scope of beneficial management actions would diminish over time. Other impacts on water resources would be the same as alternative 1. Additional adverse impacts to water quality in alternative 2 would include minimal sediment discharges to nearby waters during construction of new facilities on the mainland, minimal effects on floodplain functions due to development of new facilities in the floodplain, and potential for wetland impacts at new development sites. Additional benefits to water quality in alternative 2 would result from actions to reduce pollutant discharges from oyster houses and hunting blinds in Virginia waters.

**Vegetation**

As in alternative 1, natural resource management actions would continue to rehabilitate habitats altered by historic land uses, mosquito ditches, and invasive *Phragmites australis*; however, in alternative 2, the scope of beneficial management actions would diminish over time. Other impacts on vegetation would be the same as alternative 1. Additional adverse impacts on vegetation in alternative 2 would include vegetation losses within the island developed area in Maryland as visitor facilities and visitor activities are concentrated within a smaller area, and at new development sites on the mainland.

**Wildlife**

As in alternative 1, natural resource management actions would continue to benefit wildlife habitat by rehabilitating habitats altered by historic land uses, mosquito ditches, and invasive *Phragmites australis*; however, in alternative 2, the scope of beneficial management actions would diminish over time. Other impacts on wildlife would be the same as alternative 1. Additional adverse impacts on wildlife in alternative 2 would include habitat losses within the island developed area in Maryland as visitor facilities and visitor activities are concentrated within a smaller area, and at new development sites on the mainland. As in alternatives 3 and 4, enforcement of existing federal laws prohibiting harvest of horseshoe crabs (as proposed by FWS in the Final CCP/EIS) would effectively eliminate illegal horseshoe crab harvesting in the Toms Cove area, resulting in a beneficial~~ly~~ impact on the horseshoe crab population by directly reducing the decline of spawning horseshoe crabs in the Toms Cove area (US FWS 2015).

**Federally Listed Threatened or Endangered Species**

As in alternative 1, management actions would generally have beneficial impacts on the federally listed (threatened) piping plover (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*). Impacts on listed species would be the same as alternative 1. Additional beneficial impacts would occur as a result of reducing the OSV use area to 38 percent of its current size, thereby also reducing the extent of beach and intertidal habitats where the listed species occur that is exposed to potential impacts from vehicles and visitor use.

**Historic Structures**

Adverse impacts would result from not maintaining or stabilizing *National Register* eligible historic structures at the former Assateague Beach U.S. Coast Guard Station and the former Green Run Lodge. Lack of actions to protect eligible historic structures from natural coastal processes and/or the effects of climate change/sea level rise would further expose the resources to damage or loss. Eventually historic structures would likely be lost. Before then, historic structures would be documented in accordance with the *Secretary of the Interior's Standards* (NPS 1995c).

**Cultural Landscapes**

Adverse impacts would result from not maintaining or stabilizing the *National Register* eligible cultural landscape at the former Assateague Beach U.S. Coast Guard Station. Lack of actions to protect the eligible cultural landscape from natural coastal processes and/or the effects of climate change/sea level rise would further expose the resource to damage or loss. Eventually the cultural landscape would likely be lost. Before then, the cultural landscape would be documented in accordance with the Secretary's Standards (NPS 1995c).

**Seashore Operations**

In alternative 2, major operational efficiencies would be gained as a result of reconstruction of the seashore headquarters complex at its current site, relocation of the seashore entrance to the mainland, and implementation of a mainland-based alternative transportation system (ATS). As in alternative 1, existing partnerships and volunteer programs would continue to facilitate some functions to protect seashore resources and provide recreational opportunities. In alternative 2, an expanded partnership with USACE to protect the island developed area in Maryland would provide some protection against interruptions to seashore operations due to storm damage. Staffing would not be adequate to support natural resource management actions and visitor use and visitor experience actions included in alternative 2, unless increased funding becomes available from the Operations of National Park System (ONPS) budget.

As in alternative 1, seashore facilities would continue to be exposed to very high risk and uncertainty of becoming abruptly inaccessible in the event of a catastrophic storm, with the result that the seashore would be unable to operate without vehicular access.

**Access and Circulation**

Some congestion would remain within the Island developed area in Maryland on summer weekends following implementation of access management actions. Over the long-term concentration of visitor facilities within a shrinking fortified land area would increase congestion and reduce access. Reduction of the OSV use area to 38 percent of its current size would reduce the extent of the beach area accessible by vehicles.

As in alternative 1, due to a lack of a contingency plan for responding to catastrophic storms and the effects of climate change/sea level rise, transportation infrastructure would remain in non-sustainable locations subject to recurring damage and eventual loss as the island's land area continues to shrink. There would be very high risk and uncertainty of the seashore becoming abruptly inaccessible in the event of a catastrophic storm. The seashore could become inaccessible to visitors for months to years.

**Visitor use and Visitor Experience**

Visitor use and visitor experience at the seashore would continue as it is today, as long as there is vehicular access to the seashore. As in alternative 1, serious congestion within the Island developed area in Maryland on summer weekends would continue to adversely impact the visitor experience. In alternative 2, over time the concentration of visitor facilities within a shrinking island developed area in Maryland would increase congestion and diminish the visitor experience. Conversely, the visitor experience would be somewhat enhanced as a result of less stressful seashore entry via a relocated entrance station and opportunities for accessing the beach via a mainland-based ATS when island parking lots are full. Opportunities for driving on the beach and associated recreation activities in the OSV use area would become more congested as a result of reducing the OSV use area to 38 percent of its existing size, while retaining the current vehicle limits. If access to the OSV use area is lost due to a breach, opportunities for driving on the beach and associated recreation activities could be lost, as relocation of the OSV use area would not be considered.

As in alternative 1, due to lack of a contingency plan for responding to catastrophic storms and the effects of climate change/sea level rise, opportunities for visitors to experience the seashore would be at very high risk of being lost; opportunities for visitors could be lost for months to years.

**Socio-economic Environment**

As in alternative 1, continued seashore visitation with associated visitor spending, job creation, labor income, and value added would benefit the local economy. As in alternative 1, when vehicular access is lost, lack of contingency planning would make the island inaccessible to visitors for months to years; visitor spending would drop to approximately five percent of its previous levels with similar drops in job creation, labor income, and value added to the local economy; there would be uncertainty as to when visitor access and associated economic benefits could be restored.

As in alternatives 3 and 4, enforcement of existing federal laws prohibiting harvest of horseshoe crabs (as proposed by FWS in the Final CCP/EIS) would likely result in a negative impact to some commercial watermen (US FWS 2015). The annual value of horseshoe crab harvesting in the Toms Cove area is estimated at approximately $55,261 (US FWS 2015).

## Impacts of Alternative 3: Sustainable Recreation and Climate Change Adaptation

### Water Resources

As in alternative 1, natural resource management actions and rehabilitation of habitats altered by historic land uses and mosquito ditches would continue to restore natural surface and groundwater flows, improve wetland values, slightly enhance floodplain functions, and minimally reduce flood potentials; however, in alternative 3, the scope of beneficial management actions, particularly to wetland values, would expand over time. Other impacts on water resources would be the same as alternative 1. Additional adverse impacts to water quality in alternative 3 would include minimal sediment discharges to nearby waters during construction of new facilities on the mainland, minimal effects on floodplain functions due to development of new facilities in the floodplain, and potential for wetland impacts at new development sites (related to more new mainland facilities than alternative 2). Additional benefits to water quality in alternative 3 would result from actions to reduce pollutant discharges from oyster houses and hunting blinds in Virginia waters, reduce pollutants associated with visitor use in the north end, enhance water quality management in the coastal bays watershed through partnerships (with emphasis on cooperative acquisition of conservation

easements on the mainland), and restoration of buffer lands adjoining new mainland points of departure.

**Vegetation**

As in alternative 1, natural resource management actions would continue to rehabilitate habitats altered by historic land uses, mosquito ditches, and invasive *Phragmites australis*; however, in alternative 3, the scope of beneficial management actions, particularly those benefiting wetland habitat, would expand over time. Other impacts on vegetation would be the same as alternative 1. Additional adverse impacts on vegetation in alternative 3 would include vegetation losses at new development sites (related to more new mainland facilities than alternative 2). Additional benefits to vegetation in alternative 3 would result from a general return to more natural conditions on the island as visitor facilities are lost due to natural coastal processes and/or the effects of climate change/sea level rise and relocated to the mainland. Beneficial impacts would also result from reduced visitor use impacts in the north end.

**Wildlife**

As in alternative 1, natural resource management actions would continue to benefit wildlife by rehabilitating habitats altered by historic land uses, mosquito ditches, and invasive *Phragmites australis*; however, in alternative 3, the scope of beneficial management actions, particularly those benefiting wildlife found in wetland habitat, would expand over time. Other impacts on wildlife would be the same as alternative 1. Additional adverse impacts on wildlife in alternative 3 would include habitat losses at new development sites (related to more new mainland facilities than alternative 2). Additional benefits to wildlife in alternative 3 would result from a general return to more natural conditions on the island as visitor facilities are lost due to natural coastal processes and/or the effects of climate change/sea level rise and relocated to the mainland. Beneficial impacts would also result from reduced visitor use impacts in the north end. As in alternatives 2 and 4, enforcement of existing federal laws prohibiting harvest of horseshoe crabs (as proposed by FWS in the Final CCP/EIS) would effectively eliminate illegal horseshoe crab harvesting in the Toms Cove area, resulting in a beneficial~~ly~~ impact on the horseshoe crab population by directly reducing the decline of spawning horseshoe crabs in the Toms Cove area (US FWS 2015).

**Federally Listed Threatened or Endangered Species**

As in alternative 1, management actions would generally have beneficial impacts on the federally listed (threatened) piping plover (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*). Impacts on listed species would be the same as alternative 1. Additional benefits to listed species in alternative 3 would result from a general return to more natural conditions on the island as visitor facilities are lost due to natural coastal processes and/or the effects of climate change/sea level rise and relocated to

the mainland. Beneficial impacts would also occur as a result of reducing visitor access to the north end where these species are known to occur.

**Historic Structures**

Continued maintenance would have beneficial impacts on the seashore's historic structures that are eligible for the *National Register* at the former Assateague Beach U.S. Coast Guard Station and the former Green Run Lodge. Adaptive reuse of the station and the lodge would help to further stabilize and better maintain historic structures, particularly at the station where NPS would seek to collaborate with a partner who would assist with rehabilitation and maintenance and would occupy the building. Beneficial impacts would also result from actions to protect the sites and structures as long as feasible from natural coastal processes and/or the effects of climate change/sea level rise. Eventually historic structures would likely be significantly damaged or lost due. Before then, historic structures would be documented in accordance with the *Secretary of the Interior's Standards* (NPS 1995c).

**Cultural Landscapes**

Continued maintenance would have beneficial impacts on the *National Register* eligible cultural landscape at the former Assateague Beach U.S. Coast Guard Station. Adaptive reuse of the station would help to further stabilize and better maintain the cultural landscape, particularly with support from a partner. Beneficial impacts would also result from actions to protect the site as long as feasible from natural coastal processes and/or the effects of climate change/sea level rise. Eventually the cultural landscape would likely be significantly damaged or lost. Before then, the cultural landscape would be documented in accordance with the *Secretary of the Interior's Standards* (NPS 1995c).

**Seashore Operations**

In alternative 3, major operational efficiencies would be gained as a result of reconstruction of the seashore headquarters complex at a new location (likely to be co-located with new state park facilities) and as a result of relocation of the seashore entrance to the mainland and implementation of a mainland-based ATS (as in alternative 2). Many existing partnerships and volunteer programs would expand, and many new partnerships would be created to facilitate a much broader range of functions to protect seashore resources and provide recreational opportunities. Staffing would not be adequate to support natural resource management actions and visitor use and visitor experience actions included in alternative 3, unless increased funding becomes available from the ONPS budget.

In alternative 3, completion of a plan for water-based visitor access and seashore operations would position the seashore to restore access and operations relatively quickly in the event of potential sudden loss of access via a catastrophic storm. An expanded partnership with MD DNR would begin to immediately relocate some visitor

facilities to the mainland and to develop joint administrative and maintenance facilities on the mainland to ensure against interruptions to most seashore operations due to storm damage.

**Access and Circulation**

As in alternative 2, some congestion would remain within the Island developed area in Maryland on summer weekends following implementation of access management actions. In alternative 3, implementation of a mooring permit system would reduce accessibility to the north end via motorized vessels.

In alternative 3, completion of a plan for water-based visitor access and seashore operations would position the seashore to restore access and operations relatively quickly in the event of potential sudden loss of access via a catastrophic storm.

**Visitor use and Visitor Experience**

Visitor use and visitor experience at the seashore would continue as it is today, as long as there is vehicular access to the seashore. As in alternative 1, serious congestion within the Island developed area in Maryland on summer weekends would continue to adversely impact the visitor experience. In alternative 3, relocation of visitor facilities damaged by coastal processes to more sustainable locations on the island or ultimately to the mainland would reduce congestion and enhance the visitor experience. As in alternative 2, the visitor experience would be somewhat enhanced as a result of less stressful seashore entry via a relocated entrance station and opportunities for accessing the beach via a mainland-based ATS when island parking lots are full. As long as three is vehicular access to the island, opportunities for developed camping at the seashore would be maintained by replacing lost or damaged developed campsites in more sustainable locations on the island. Opportunities for visitor experiences in the backcountry would be enhanced by addition of two mainland points of departure, three bayside access points, and camping opportunities on Egging Island. Opportunities for visitors in the north end would be diminished due to implementation of a mooring permit for motorized vessels that would make it harder for visitors to access the area. OSV use would continue within the existing OSV use area; if access to the OSV use area is lost due to a breach, opportunities for driving on the beach and associated recreation activities could be maintained by relocation of the OSV use area to an area north Assateague State Park.

Contingency planning would include completion of a plan for water-based access and seashore operations; this would position the seashore to restore visitor access to seashore experiences relatively quickly in the event of potential sudden loss of access via a catastrophic storm. An expanded partnership with MD DNR would begin planning to relocate developed campsites to the mainland to ensure opportunities for developed camping in the event vehicular access is lost.

**Socio-economic Environment**

As in alternatives 1 and 2, continued seashore visitation with associated visitor spending, job creation, labor income, and value added would benefit the local economy. In alternative 3, when vehicular access is lost, contingency planning would relatively quickly restore access to the island; until access is restored visitor spending would drop to approximately five percent of its previous levels with similar drops in job creation, labor income, and value added to the local economy. In alternative 3, within a few years visitation would return to or near that when vehicular access was possible.

As in alternatives 2 and 4, enforcement of existing federal laws prohibiting harvest of horseshoe crabs (as proposed by FWS in the Final CCP/EIS) would likely result in a negative impact to some commercial watermen (US FWS 2015). The annual value of horseshoe crab harvesting in the Toms Cove area is estimated at approximately $55,261 (US FWS 2015).

## Impacts of Alternative 4: Natural Island Evolution and a Primitive Island Experience

### Water Resources

As in alternative 1, natural resource management actions and rehabilitation of habitats altered by historic land uses and mosquito ditches would continue to restore natural surface and groundwater flows, improve wetland values, slightly enhance floodplain functions, and minimally reduce flood potentials; however, in alternative 4 (as in alternative 3), the scope of beneficial management actions, particularly to wetland values, would expand over time. Other impacts on water resources would be the same as alternative 1. Additional adverse impacts to water quality in alternative 4 would include minimal sediment discharges to nearby waters during construction of new facilities on the mainland, minimal effects on floodplain functions due to development of new facilities in the floodplain, and potential for wetland impacts at new development sites (related to more facilities than alternative 2, but fewer than alternative 3). Additional benefits to water quality in alternative 3 would result from actions to reduce pollutant discharges from oyster houses and hunting blinds in Virginia waters, reduce pollutants associated with visitor use in the north end, enhance water quality management in the coastal bays watershed through partnerships, and restoration of buffer lands adjoining new mainland points of departure.

**Vegetation**

As in alternative 1, natural resource management actions would continue to rehabilitate habitats altered by historic land uses, mosquito ditches, and invasive *Phragmites australis*; however, in alternative 4 (as in alternative 3), the scope of beneficial management actions, particularly those benefiting wetland habitat, would expand over time. Other impacts on vegetation would be the same as alternative 1. Additional adverse impacts on vegetation in alternative 4 would include vegetation losses at new development sites (related to more new mainland facilities than alternative 2, but fewer than alternative 3). Additional benefits to vegetation in alternative 4 would result from a general return to more natural conditions on the island as visitor facilities are lost due to natural coastal processes and/or the effects of climate change/sea level rise and relocated to the mainland; this would be the same as alternative 3, but would occur sooner. Beneficial impacts would also result from elimination of most visitor use impacts on vegetation in the north end.

**Wildlife**

As in alternative 1, natural resource management actions would continue to benefit wildlife by rehabilitating habitats altered by historic land uses, mosquito ditches, and invasive *Phragmites australis*; however, in alternative 4 (as in alternative 3), the scope of beneficial management actions, particularly those benefiting wildlife found in wetland habitat, would expand over time. Other impacts on wildlife would be the same as alternative 1. Additional adverse impacts on wildlife in alternative 4 would include habitat losses at new development sites (related to more new mainland facilities than alternative 2, but fewer than alternative 3). Additional benefits to wildlife in alternative 4 would result from a general return to more natural conditions on the island as visitor facilities are lost due to natural coastal processes and/or the effects of climate change/sea level rise and relocated to the mainland; this would be the same as alternative 3, but would occur sooner. Beneficial impacts would also result from elimination of most visitor use impacts on habitat in the north end. As in alternatives 2 and 3, enforcement of existing federal laws prohibiting harvest of horseshoe crabs (as proposed by FWS in the Final CCP/EIS) would effectively eliminate illegal horseshoe crab harvesting in the Toms Cove area, resulting in a beneficial~~ly~~ impact on the horseshoe crab population by directly reducing the decline of spawning horseshoe crabs in the Toms Cove area (US FWS 2015).

**Federally Listed Threatened or Endangered Species**

As in alternative 1, management actions would generally have beneficial impacts on the federally listed (threatened) piping plover (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*). Impacts on listed species would be the same as alternative 1. Additional benefits to listed species in alternative 4 would result from a general return to more natural conditions on the island as visitor facilities are lost due to natural coastal processes and/or the effects of climate change/sea level rise and relocated to

the mainland; this would be the same as alternative 3, but would occur sooner. Beneficial impacts would also occur as a result of elimination of most visitor use impacts on habitat in the north end.

**Historic Structures**

Continued maintenance would have beneficial impacts on the seashore's historic structures that are eligible for the *National Register* at the former Assateague Beach U.S. Coast Guard Station and the former Green Run Lodge. Adaptive reuse of the lodge would help to further stabilize and better maintain the historic structure. Limited actions to protect eligible historic structures from natural coastal processes and/or the effects of climate change/sea level rise would also have beneficial impacts. Eventually historic structures would likely be significantly damaged or lost. Before then, historic structures would be documented in accordance with the *Secretary of the Interior's Standards* (NPS 1995c).

**Cultural Landscapes**

Continued maintenance would have beneficial impacts on the *National Register* eligible cultural landscape at the former Assateague Beach U.S. Coast Guard Station. Limited actions to protect the eligible cultural landscape from natural coastal processes and/or the effects of climate change/sea level rise would also have some short-term beneficial impacts. Eventually the cultural landscape would likely be significantly damaged or lost. Before then, the cultural landscape would be documented in accordance with the *Secretary of the Interior's Standards* (NPS 1995c).

**Seashore Operations**

In alternative 4, major operational efficiencies would result from reconstruction of the seashore headquarters complex at a new location (likely to be co-located with new state park facilities) (as in alternative 3) and as a result of relocation of the seashore entrance to the mainland and implementation of a mainland-based ATS (as in alternatives 2 and 3). A few existing partnerships and volunteer programs would expand and a few new partnerships would be created to facilitate more functions to protect seashore resources and provide recreational opportunities. Staffing would not be adequate to support natural resource management actions and visitor use and visitor experience actions included in alternative 4, unless increased funding becomes available from the ONPS budget.

In alternative 4, as in alternative 3, completion of a plan for water-based visitor access and seashore operations would position the seashore to restore access and operations relatively quickly in the event of potential sudden loss of access via a catastrophic storm. An expanded partnership with MD DNR would begin to immediately develop joint administrative and maintenance facilities on the mainland to ensure against interruptions to most seashore operations due to storm damage (as in alternative 3).

**Access and Circulation**

As in alternative 3, some congestion would remain within the Island developed area in Maryland on summer weekends following implementation of access management actions. In alternative 4, access to the north end would be reduced as a result of closing the area to motorized vessels.

As in alternative 3, completion of a plan for water-based visitor access and seashore operations would position the seashore to restore access and operations relatively quickly in the event of potential sudden loss of access via a catastrophic storm.

**Visitor use and Visitor Experience**

Visitor use and visitor experience at the seashore would continue as it is today, as long as there is vehicular access to the seashore. As in alternative 1, serious congestion within the Island developed area in Maryland on summer weekends would continue to adversely impact the visitor experience. As in alternatives 2 and 3, the visitor experience would be somewhat enhanced as a result of less stressful seashore entry via a relocated entrance station and opportunities for accessing the beach via a mainland-based ATS when island parking lots are full. In alternative 4, visitor facilities damaged by coastal processes would generally not be replaced, which would result in a loss of opportunities for some existing recreation activities, thereby diminishing the visitor experience for many but enhancing if for others seeking a more primitive visitor experience. This adverse impact would be offset somewhat by replacement of lost or damaged developed campsites with up to 150 primitive campsites in more sustainable locations on the island. Opportunities for visitors in the north end would be diminished due to prohibition of access to the area via motorized vessels, making it much harder for visitors to access the area. OSV use would continue within the existing OSV use area. As in alternatives 1 and 2, if access to the OSV use area is lost due to a breach, opportunities for driving on the beach and associated recreation activities could be lost, as relocation of the OSV use area would not be considered.

Contingency planning would include completion of a plan for water-based access and seashore operations; this would position the seashore to restore visitor access to seashore experiences relatively quickly in the event of potential sudden loss of access via a catastrophic storm. An expanded partnership with MD DNR would begin planning to relocate developed campsites to the mainland to ensure opportunities for developed camping in the event vehicular access is lost.

**Socio-economic Environment**

As in alternatives 1, 2, and 3, continued seashore visitation with associated visitor spending, job creation, labor income, and value added would benefit the local economy. As in alternative 3, when vehicular access is lost, contingency planning would relatively quickly restore access to the island; until access is restored visitor spending would drop

to approximately five percent of its previous levels with similar drops in job creation, labor income, and value added to the local economy; there would be certainty as to when visitor access via water-based transportation would be restored. In alternative 4, within a few years visitation would return to approximately 50 percent of that when vehicular access was possible.

As in alternatives 2 and 3, enforcement of existing federal laws prohibiting harvest of horseshoe crabs (as proposed by FWS in the Final CCP/EIS) would likely result in a negative impact to some commercial watermen (US FWS 2015). The annual value of horseshoe crab harvesting in the Toms Cove area is estimated at approximately $55,261 (US FWS 2015).

### Next Steps

The Draft GMP/EIS for the seashore will be on public and agency review for 60 days following publication of the Environmental Protection Agency's Notice of Availability in the *Federal Register*. During the review period, the public will have opportunities to provide comments on the management alternatives, including the NPS preferred alternative. The NPS will hold public meetings where comments can be made. The public will also be able to comment on-line and by letter, which must be post marked by the due date posted on the NPS Planning, Environment, and Public Comment (PEPC)

website. Information on how the public can provide comments and any public meetings that could be held during the review period will be available on the NPS PEPC web site and in news releases.

The NPS will review and evaluate all comments received on the Draft GMP/EIS. The results of the public and agency comments will be incorporated into a Final GMP/EIS that will be made available to the public for a 30-day no-action period, after which a Record of Decision may be prepared to document the selection of an alternative as the approved GMP/EIS for the seashore.

The Draft GMP/EIS presents an overview of potential actions and impacts related to the management concepts for the seashore. Once a GMP/EIS is approved, implementation of actions in the approved GMP/EIS will be subject to site-specific planning and compliance in accordance with all applicable requirements.

## Implementation of the Plan

Implementation of the approved general management plan will depend on future NPS funding and servicewide priorities. Some actions will also depend upon partnership funds, time, and effort. The approval of a Final GMP/EIS does not guarantee that funding and staffing needed to implement the plan will be forthcoming. Full implementation of the plan could be many years in the future.

Once the NPS Regional Director has approved the plan, additional feasibility studies and more detailed planning, environmental documentation, and consultations would be completed, as appropriate, before the NPS can implement certain actions in the selected alternative. Future program and implementation plans, describing specific actions that managers intend to undertake and accomplish, will tier from the desired conditions and long-term goals set forth in this GMP/EIS.

# Table of Contents

**1. Purpose and Need**

1.1 Protecting and Enhancing the Seashore Experience – A Long-Term Plan for Management ....1-1

1.1.1 Purpose of the Plan....1-1
1.1.2 Need for the Plan....1-2
1.1.3 Plan Development ....1-2
1.1.4 Next Steps and Plan Implementation ....1-4

1.2 Seashore Overview ....1-4

1.2.1 Seashore Origin and Legislative History....1-4
1.2.2 Seashore Boundary and Ownership ....1-7
1.2.3 Regional Context....1-8
1.2.4 Natural Resources....1-9
1.2.5 Cultural Resources ....1-10
1.2.6 Visitor Experience and Visitor Use....1-12

1.3 Relationship to Chincoteague National Wildlife Refuge ....1-12

1.3.1 Refuge Establishment and Overview ....1-12
1.3.2 Recreational Use at the Refuge ....1-13
1.3.3 *Draft Comprehensive Conservation Plan and Environmental Impact Statement for Chincoteague and Wallops Island National Wildlife Refuges*....1-15

1.4 Guidance for Seashore Planning, Development, and Management ....1-18

1.4.1 Seashore Purpose ....1-18
1.4.2 Seashore Significance ....1-18
1.4.3 Seashore Resources and Values ....1-20
1.4.4 Interpretive Themes ....1-24
1.4.5 Legislative Mandates and Special Designations ....1-25
1.4.6 Other Legislative and Policy Requirements ....1-29

1.5 Planning Issues....1-31

1.5.1 Natural Coastal Processes and Effects of Climate Change....1-31
1.5.2 Visitor Use and Visitor Experience....1-32
1.5.3 Partnerships....1-34
1.5.4 Wilderness ....1-35
1.5.5 Cultural Resources ....1-36

1.6 Impact Topics ....1-37

1.6.1 Impact Topics Retained for Further Analysis ....1-37
1.6.2 Impact Topics Considered and Dismissed from Further Analysis ....1-38

1.7 The Seashore's Wilderness ....1-45

1.8 The Seashore's Boundary....1-46

1.9 Related Plans....1-48

1.9.1 National Park Service Plans....1-48
1.9.2 U.S. Fish and Wildlife Service Plans ....1-52
1.9.3 State of Maryland Plans....1-52
1.9.4 Local Government Plans ....1-53
1.9.5 Other Plans and Projects ....1-57

**2. Alternatives**

2.1 Development of Alternatives ....2-1

2.2 Climate Change Response for Assateague Island ....2-3

2.2.1 Background ....2-3
2.2.2 The Seashore's Climate Change Response – GMP/EIS Alternatives ....2-4
2.2.3 Strategies for Seashore Facilities and Operations ....2-5
2.2.4 Strategies for Responding to Changing Conditions ....2-6
2.2.5 Engaging the Scientific Community and Visitors in Climate Change ....2-7

2.3 Alternative 1 – Continuation of Current Management....2-8

2.3.1 Overall Concept ....2-8
2.3.2 Visitor Use and Visitor Experience....2-8
2.3.3 Visitor Facilities and Infrastructure....2-10
2.3.4 Natural Resource Management....2-11
2.3.5 Cultural Resource Management ....2-13
2.3.6 Seashore Operations ....2-14
2.3.7 Partnerships....2-14
2.3.8 Land Acquisition....2-15
2.3.9 Seashore Boundary....2-15
2.3.10 Planned and Programmed Projects ....2-15
2.3.11 Costs ....2-15

2.4 Management Guidance and Actions Common to the Action Alternatives (Common to Alternatives 2, 3, and 4)....2-19

2.4.1 Management Zoning and Desired Conditions ....2-19
2.4.2 Community Resilience ....2-21
2.4.3 Visitor Use and Visitor Experience....2-27
2.4.4 Visitor Facilities and Infrastructure....2-29
2.4.5 Natural Resource Management....2-30
2.4.6 Cultural Resource Management ....2-33
2.4.7 Seashore Operations ....2-33
2.4.8 Partnerships....2-33
2.4.9 Land Acquisition....2-34
2.4.10 Seashore Boundary....2-34
2.4.11 Examples of Actions Needed to Achieve Desired Future Conditions ....2-34

2.4.12 Costs .....2-34

2.5 Alternative 2 – Concentrated Traditional Beach Recreation .....2-36

2.5.1 Overall Concept .....2-36
2.5.2 Visitor Use and Visitor Experience .....2-36
2.5.3 Visitor Facilities and Infrastructure .....2-39
2.5.4 Natural Resource Management .....2-39
2.5.5 Cultural Resource Management .....2-40
2.5.6 Seashore Operations .....2-41
2.5.7 Partnerships .....2-42
2.5.8 Land Acquisition .....2-42
2.5.9 Seashore Boundary .....2-42
2.5.10 Examples of Actions Needed to Achieve Desired Future Conditions .....2-43
2.5.11 Costs .....2-43

2.6 Alternative 3 – Sustainable Recreation and Climate Change Adaptation .....2-47

2.6.1 Overall Concept .....2-47
2.6.2 Visitor Use and Visitor Experience .....2-47
2.6.3 Visitor Facilities and Infrastructure .....2-50
2.6.4 Natural Resource Management .....2-52
2.6.5 Cultural Resource Management .....2-53
2.6.6 Seashore Operations .....2-54
2.6.7 Partnerships .....2-56
2.6.8 Land Acquisition .....2-57
2.6.9 Seashore Boundary .....2-57
2.6.10 Examples of Actions Needed to Achieve Desired Future Conditions .....2-58
2.6.11 Costs .....2-58

2.7 Alternative 4 – Natural Island Evolution and a Primitive Island Experience .....2-63

2.7.1 Overall Concept .....2-63
2.7.2 Visitor Use and Visitor Experience .....2-63
2.7.3 Visitor Facilities and Infrastructure .....2-66
2.7.4 Natural Resource Management .....2-67
2.7.5 Cultural Resource Management .....2-68
2.7.6 Seashore Operations .....2-69
2.7.7 Partnerships .....2-71
2.7.8 Land Acquisition .....2-71
2.7.9 Seashore Boundary .....2-71
2.7.10 Examples of Actions Needed to Achieve Desired Future Conditions .....2-72
2.7.11 Costs .....2-72

2.8 Indicators and Standards .....2-76

2.9 Mitigation Measures included in the Alternatives .....2-79

2.10 Cost Comparison .....2-82

2.10.1 Estimated Costs for Implementing the Plan .....2-82
2.10.2 Funding for Actions Identified in the Plan .....2-82

2.11 Comparison of Alternatives .....2-84

2.12 Comparison of Impacts of the Alternatives .....2-91

2.13 Consistency with Section 101 and 102(1) of NEPA .....2-104

2.14 Environmentally Preferable Alternative .....2-108

2.15 Identification of the NPS Preferred Alternative .....2-108

2.16 Future Planning and Implementation (NPS Preferred Alternative) .....2-109

**3. Affected Environment**

3.1 Introduction .....3-1

3.1.1 Seashore Context .....3-1
3.1.2 Seashore Significance .....3-1

3.2 Climate Change/Sea Level Rise .....3-7

3.3 Natural Coastal Processes .....3-8

3.4 Water Resources .....3-13

3.4.1 Nearshore Ocean Waters .....3-13
3.4.2 Coastal Bays .....3-13
3.4.3 Wetlands .....3-16
3.4.4 Ponds .....3-18
3.4.5 Floodplains .....3-19
3.4.6 Surface Aquifer and Fresh Groundwater System .....3-19

3.5 Vegetation .....3-20

3.5.1 Plant Species of Special Concern .....3-22

3.6 Wildlife .....3-23

3.6.1 Marine Wildlife .....3-23
3.6.2 Coastal Bay and Terrestrial Invertebrates .....3-25
3.6.3 Fish .....3-29
3.6.4 Amphibians and Reptiles .....3-31
3.6.5 Birds .....3-32
3.6.6 Mammals .....3-35
3.6.7 Wildlife Species of Special Concern .....3-36

3.7 Federally Listed Threatened or Endangered Species .....3-40

3.7.1 Piping Plover (*Charadrius melodus*) .....3-40
3.7.2 Seabeach Amaranth (*Amaranthus pumilus*) .....3-42
3.7.3 Sea Turtles .....3-42

3.7.4 Whales ....3-45

3.8 Historic Structures....3-47

3.8.1 Assateague Beach U.S. Coast Guard Station....3-47
3.8.2 Green Run Lodge ....3-48
3.8.3 Other Structures from the Historic Period ....3-51

3.9 Cultural Landscapes ....3-51

3.9.1 Assateague Beach U.S. Coast Guard Station Cultural Landscape ....3-51
3.9.2 Assateague Island Cultural Landscape....3-51

3.10 Wilderness ....3-52

3.10.1 Potential and Recommended Wilderness ....3-52
3.10.2 Current Conditions....3-53
3.10.3 Management of Visitor Use....3-54
3.10.4 Management of Administrative Activities ....3-55

3.11 Seashore Operations....3-56

3.11.1 Operational Staffing and Funding....3-56
3.11.2 Operations Facilities and Infrastructure ....3-57
3.11.3 Partnerships....3-60

3.12 Access and Circulation ....3-63

3.12.1 Access and Circulation in Maryland....3-63
3.12.2 Access and Circulation in Virginia ....3-72

3.13 Visitor Use and Visitor Experience ....3-75

3.13.1 Visitor Use....3-75
3.13.2 Visitor Activities and Related Facilities ....3-76
3.13.3 Opportunities for Visitors with Disabilities....3-82
3.13.4 Commercial Services, Special Uses, and Tours ....3-83
3.13.5 Visitor Orientation, Interpretation, and Education ....3-83

3.14 Socio-economic Environment ....3-86

3.14.1 Regional Context – Worcester and Accomack Counties....3-87
3.14.2 Gateways to the Seashore ....3-89
3.14.3 Economic Benefits of Tourism ....3-94
3.14.4 Economic Benefits of Assateague Island National Seashore ....3-95

**4. Environmental Consequences**

4.1 General Methodology for Analyzing Impacts....4-1

4.1.1 Geographic Area Evaluated for Impacts ....4-1

4.1.2 Analysis of Impacts ....4-1
4.1.3 Assessing Impacts Using CEQ Criteria ....4-2

4.2 Water Resources ....4-4

4.2.1 Methodology ....4-4
4.2.2 Alternative 1 – Continuation of Current Management ....4-5
4.2.3 Impacts Common to All Action Alternatives ....4-11
4.2.4 Alternative 2 – Concentrated Traditional Beach Recreation ....4-13
4.2.5 Alternative 3 – Sustainable Recreation and Climate Change Adaptation ....4-17
4.2.6 Alternative 4 – Natural Island Evolution and a Primitive Island Experience ....4-25

4.3 Vegetation ....4-30

4.3.1 Methodology ....4-30
4.3.2 Alternative 1 – Continuation of Current Management ....4-31
4.3.3 Impacts Common to All Action Alternatives ....4-37
4.3.4 Alternative 2 – Concentrated Traditional Beach Recreation ....4-38
4.3.5 Alternative 3 – Sustainable Recreation and Climate Change Adaptation ....4-43
4.3.6 Alternative 4 – Natural Island Evolution and a Primitive Island Experience ....4-50

4.4 Wildlife ....4-55

4.4.1 Methodology ....4-55
4.4.2 Alternative 1 – Continuation of Current Management ....4-56
4.4.3 Impacts Common to All Action Alternatives ....4-63
4.4.4 Alternative 2 – Concentrated Traditional Beach Recreation ....4-64
4.4.5 Alternative 3 – Sustainable Recreation and Climate Change Adaptation ....4-70
4.4.6 Alternative 4 – Natural Island Evolution and a Primitive Island Experience ....4-77

4.5 Federally Listed Threatened or Endangered Species ....4-82

4.5.1 Methodology ....4-82
4.5.2 Alternative 1 – Continuation of Current Management ....4-83
4.5.3 Impacts Common to All Action Alternatives ....4-89
4.5.4 Alternative 2 – Concentrated Traditional Beach Recreation ....4-90
4.5.5 Alternative 3 – Sustainable Recreation and Climate Change Adaptation ....4-95
4.5.6 Alternative 4 – Natural Island Evolution and a Primitive Island Experience ....4-102

4.6 Historic Structures ....4-108

4.6.1 Methodology ....4-108
4.6.2 Alternative 1 – Continuation of Current Management ....4-109
4.6.3 Impacts Common to All Action Alternatives ....4-111
4.6.4 Alternative 2 – Concentrated Traditional Beach Recreation ....4-111
4.6.5 Alternative 3 – Sustainable Recreation and Climate Change Adaptation ....4-113
4.6.6 Alternative 4 – Natural Island Evolution and a Primitive Island Experience ....4-115

4.7 Cultural Landscapes ....4-117

4.7.1 Methodology ....4-117
4.7.2 Alternative 1 – Continuation of Current Management ....4-118

4.7.3 Impacts Common to All Action Alternatives ....4-120
4.7.4 Alternative 2 – Concentrated Traditional Beach Recreation ....4-120
4.7.5 Alternative 3 – Sustainable Recreation and Climate Change Adaptation....4-122
4.7.6 Alternative 4 – Natural Island Evolution and a Primitive Island Experience....4-124

4.8 Seashore Operations ....4-126

4.8.1 Methodology ....4-126
4.8.2 Alternative 1 – Continuation of Current Management ....4-127
4.8.3 Impacts Common to All Action Alternatives ....4-131
4.8.4 Alternative 2 – Concentrated Traditional Beach Recreation ....4-132
4.8.5 Alternative 3 – Sustainable Recreation and Climate Change Adaptation....4-135
4.8.6 Alternative 4 – Natural Island Evolution and a Primitive Island Experience....4-139

4.9 Access and Circulation ....4-143

4.9.1 Methodology ....4-143
4.9.2 Alternative 1 – Continuation of Current Management ....4-144
4.9.3 Impacts Common to All Action Alternatives ....4-148
4.9.4 Alternative 2 – Concentrated Traditional Beach Recreation ....4-149
4.9.5 Alternative 3 – Sustainable Recreation and Climate Change Adaptation....4-151
4.9.6 Alternative 4 – Natural Island Evolution and a Primitive Island Experience....4-155

4.10 Visitor Use and Visitor Experience ....4-159

4.10.1 Methodology ....4-159
4.10.2 Alternative 1 – Continuation of Current Management ....4-160
4.10.3 Impacts Common to All Action Alternatives ....4-164
4.10.4 Alternative 2 – Concentrated Traditional Beach Recreation ....4-164
4.10.5 Alternative 3 – Sustainable Recreation and Climate Change Adaptation....4-169
4.10.6 Alternative 4 – Natural Island Evolution and a Primitive Island Experience....4-174

4.11 Socio-economic Environment ....4-178

4.11.1 Methodology ....4-178
4.11.2 Alternative 1 – Continuation of Current Management ....4-179
4.11.3 Impacts Common to All Action Alternatives ....4-183
4.11.4 Alternative 2 – Concentrated Traditional Beach Recreation ....4-184
4.11.5 Alternative 3 – Sustainable Recreation and Climate Change Adaptation....4-187
4.11.6 Alternative 4 – Natural Island Evolution and a Primitive Island Experience....4-192

4.12 Relationship between Local Short-term Uses of the Environment and Maintenance of Long-term Productivity ....4-196

4.13 Irreversible or Irretrievable Commitments of Resources ....4-196

4.12.1 Alternative 1 ....4-196
4.12.2 Alternative 2 ....4-196
4.12.3 Alternative 3 ....4-197
4.12.4 Alternative 4 ....4-197

4.14 Adverse Impacts that could not be Avoided ....4-197

4.12.1 Alternative 1 ....4-197
4.12.2 Alternative 2 ....4-198
4.12.3 Alternative 3 ....4-198
4.12.4 Alternative 4 ....4-198

**5. Consultation and Coordination**

5.1 Public Involvement and Agency Coordination ....5-1
5.2 Section 106 Consultation ....5-6
5.3 Section 7 Consultation ....5-7
5.4 Consultation with State Natural Resource Management Agencies ....5-8
5.5 Coastal Zone Management Act/Federal Consistency ....5-8
5.6 Tribal Coordination ....5-9
5.7 Draft GMP/EIS Document Review ....5-9
5.8 List of Preparers ....5-10
5.9 List of Draft GMP/EIS Recipients ....5-12

**Appendices**

Appendix A Assateague Island National Seashore Enabling Legislation ....A-1
Appendix B Memorandum of Understanding between the National Park Service and the U.S. Fish and Wildlife Service for Interagency Cooperation at Assateague Island National Seashore and Chincoteague National Wildlife Refuge ....B-1
Appendix C Agency Correspondence ....C-1
Appendix D Summary of Public Involvement Activities ....D-1

**References**

**Glossary**

**List of Figures**

Figure 1.1 Regional Location ....1-3
Figure 1.2 Seashore Ownership and Management Responsibilities ....1-5

Figure 2.1 Seashore Places ....2-9
Figure 2.2 Alternative 2 – Management Zones ....2-37
Figure 2.3 Alternative 3 – Management Zones ....2-49
Figure 2.4 Alternative 4 – Management Zones ....2-65

Figure 3.1 Assateague Island National Seashore (subarea key) ....3-2
Figure 3.2a North End ....3-3
Figure 3.2b Developed Area ....3-4
Figure 3.2c Backcountry ....3-5
Figure 3.2d Toms Cove ....3-6
Figure 3.3 General Barrier Island Geomorphic Processes ....3-10
Figure 3.4 Accelerated Erosion Caused by Jetties, Groins, and Other Efforts to Stabilize the Ocean City Inlet ....3-11
Figure 3.5 Cultural Resources ....3-49

Figure 3.6 Park Asset Analysis – Summary of Findings ....3-60
Figure 3.7 Regional Access to the Seashore ....3-65
Figure 3.8 Seashore Access and Circulation ....3-66
Figure 3.9 Visitor Use and Visitor Experience ....3-77
Figure 3.10 Gateway Communities ....3-90

**List of Tables**

Table 1.1 Interpretive Themes ....1-24
Table 1.2 Legislative Mandates ....1-26
Table 1.3 Other Special Mandates ....1-28
Table 1.4 Special Seashore Designations ....1-30
Table 1.5 Impact Topics Retained for Further Analysis ....1-37

Table 2.1 Overall Management Concepts for the Alternatives ....2-1
Table 2.2 Alternative 1 – Planned and Programmed Projects ....2-17
Table 2.3 Management Zone Summary – Common to Alternatives 2, 3, and 4 ....2-20
Table 2.4 Desired Conditions by Management Zone and Area – Common to Alternatives 2, 3, and 4 ....2-22
Table 2.5 Alternatives 2, 3, and 4 – Examples of Actions Needed to Achieve Desired Conditions ....2-35
Table 2.6 Alternative 2 – Examples of Actions Needed to Achieve Desired Conditions ....2-45
Table 2.7 Alternative 3 – Examples of Actions Needed to Achieve Desired Conditions ....2-60
Table 2.8 Alternative 4 – Examples of Actions Needed to Achieve Desired Conditions ....2-74
Table 2.9 Indicators and Standards ....2-77
Table 2.10 Mitigation Measures included in the Alternatives ....2-79
Table 2.11 Alternative Cost Comparison (2012 dollars) ....2-83
Table 2.12 Comparison of Alternatives (Maryland District) ....2-84
Table 2.13 Comparison of Alternatives (Virginia District) ....2-89
Table 2.14 Comparison of Impacts of the Alternatives ....2-91
Table 2.15 Summary of Future Implementation Planning Needs (NPS Preferred Alternative ....2-109

Table 3.1 Assateague Island National Seashore – Climate Change Projections ....3-9
Table 3.2 Dominant Vegetative Communities ....3-21
Table 3.3 Plant Species of Special Concern (Maryland) ....3-24
Table 3.4 Wildlife Species of Special Concern (Maryland) ....3-37
Table 3.5 Federally Listed Threatened and Endangered Species ....3-40
Table 3.6 Generalized Seashore Asset Analysis Categories ....3-59
Table 3.7 Volunteers in Park Program Participation ....3-60
Table 3.8 Entities that Help the NPS Accomplish Its Mission at Assateague Island National Seashore ....3-61
Table 3.9 Parking Areas (for public use) ....3-67
Table 3.10 Storm Damage to Toms Cove Recreational Beach Facilities (1991 through 2011) ....3-74
Table 3.11 Total Visitation (1967-2012) ....3-75
Table 3.12 Visitor Use Statistics (2000 -2012) ....3-76
Table 3.13 Accessible Facilities ....3-82
Table 3.14 Housing, Employment, and Income Overview (200 and 2010Total Visitation (1967-2011) ....3-87
Table 3.15 Employment by Industry – 2010 Annual Average ....3-88

Table 3.16 Gateway Community Population, Housing, and Employment Overview – 2000 and 2010 ....3-91
Table 3.17 Economic Impacts of Tourism (2010) ....3-95
Table 3.18 Local-Level Impacts of NPS Visitor Spending ....3-95

Table 4.1 Estimated Local-Level Impacts of NPS Visitor Spending on Local Economies – Alternative 1 ....4-181
Table 4.2 Estimated Local-Level Impacts of NPS Visitor Spending on Local Economies – Alternative 2 ....4-185
Table 4.3 Estimated Local-Level Impacts of NPS Visitor Spending on Local Economies – Alternative 3 ....4-188
Table 4.4 Estimated Local-Level Impacts of NPS Visitor Spending on Local Economies – Alternative 4 ....4-193

Table 5.1 Summary of Public Involvement and Agency Coordination ....5-2

# Acronyms

**ACHP** – Advisory Council on Historic Preservation

**ATS** – alternative transportation system

**API** – Asset priority index

**ARD –** Air Resources Division

**ASIS** – Assateague Island National Seashore

**ASP** – Assateague State Park

**BMPs** – best management practices

**BOEMRE** – Bureau of Ocean Energy Management, Regulation and Enforcement (formerly Minerals Management Service)

**CBA** – Choosing By Advantages

**CCMP** – Comprehensive Conservation and Management Plan (for Maryland Coastal Bays National Estuary)

**CCP/EIS** –Chincoteague and Wallops Island National Wildlife Refuges Final Comprehensive Conservation Plan and Environmental Impact Statement

**CZMP** – coastal zone management program

**CEQ** – Council on Environmental Quality

**CFR** – Code of Federal Regulations

**CNWR** – Chincoteague National Wildlife Refuge

**CVI** – coastal vulnerability index

**DO** – director's order

**DOI** – Department of Interior

**EIS** – environmental impact statement

**EO** – executive order

**EPA** – U.S. Environmental Protection Agency

**FCI** – facilities condition index

**FEMA** – Federal Emergency Management Agency

**FFRMS** – Federal Flood Risk Management Standard

**FHWA** – Federal Highway Administration

**FMSS** – Facility Management Software System

**FR** – Federal Register

**FTE** – full-time equivalent (staff positions)

**FWS** – U.S. Fish and Wildlife Service

**GAO** – U.S. Government Accountability Office

**GMP** – general management plan

**GPRA** – Government Performance and Results Act

**IBA** – important bird area (as designated by the National Audubon Society)

**IPPC** – Intergovernmental Panel on Climate Change

**IUCN** – International Union for the Conservation of Nature

**LRIP** – long range interpretive plan

**MAB** – Mid-Atlantic Bight

**MCBP** – Maryland Coastal Bays Program

**MDOT** – Maryland Department of Transportation

**MDP** – Maryland Department of Planning

**MD DBED** – Maryland Department of Business and Economic Development

**MD DNR** – Maryland Department of Natural Resources

**MD GS** – Maryland Geological Survey

**MD OTD** – Maryland Office of Tourism Development

**MD SHA**- Maryland State Highway Administration

**MOA** – memorandum of agreement

**MOU** – memorandum of understanding

**NASA** – National Aeronautics and Space Administration

**NEPA** – National Environmental Policy Act

**NHPA** – National Historic Preservation Act

**NOI** – Notice of Intent

**NOAA** – National Oceanic and Atmospheric Administration

**NPCA** – National Parks Conservation Association

**NPS** – National Park Service

**NRCS** – U.S Department of Agriculture Natural Resources and Conservation Service

**NWI** – U.S. Fish and Wildlife Service National Wetland Inventory

**NWS** – National Weather Service

**ONPS** – Operations of the National Park System

**OSV** – over-sand vehicle

**PEPC** – NPS Planning, Environment and Public Comment System

**PL** – public law

**PPA** – priority preservation area

**ppm** – parts per million

**PWC** – personal watercraft

**ROD** – record of decision

**ROW** – right-of-way

**SHPO** – state historic preservation officer/office

**USC** – U.S. Code

**VDOT** – Virginia Department of Transportation

**VA DCR** – Virginia Department of Conservation and Recreation

**VMS** – variable messaging system

**VIP** – Volunteers in Park

**UNEP** – United Nations Environment Programme

**USACE** – U.S. Army Corps of Engineers

**OSDS** – on-site disposal system

**US DC** – U.S. Department of Commerce, Bureau of the Census

**US DOT** – U.S. Department of Transportation

**USGS** – U.S. Geological Survey

**VMS** – variable message system

**WHSRN** – Western Hemisphere Shorebird Reserve Network

## How to Read This Plan…

The National Park Service (NPS) has developed this Draft GMP/EIS to guide management decision-making at Assateague Island National Seashore. The public and many local, state, and federal agencies have assisted the NPS with preparing the Draft GMP/EIS. This Draft GMP/EIS is divided into five chapters.

**Chapter 1 – Purpose of and Need for Action** describes the proposed action and reasons why the GMP/EIS is being prepared. Chapter 1 presents the seashore's purpose and significance statements and describes the fundamental and other important resources and values that are critical to achieving the seashore's purpose and maintaining its significance. This section also describes the planning process and issues addressed in the Draft GMP/EIS.

**Chapter 2 – Alternatives** describes, evaluates, and compares the continuation of current management alternative and three action alternatives. The continuation of current management alternative provides a baseline from which the three action alternatives can be evaluated. Desired resource conditions, opportunities for visitor experience, as well as levels of development intensity necessary to accomplish each alternative are presented. Alternative 3 is the NPS preferred alternative and the environmentally preferable alternative.

**Chapter 3 – Affected Environment** describes the existing conditions of the natural, cultural, and socioeconomic resources that could be potentially affected by implementing either one of the alternatives.

**Chapter 4 – Environmental Consequences** describes the potential impacts to the seashore's resource values that could result from implementing any of the alternatives and the relative importance of those impacts in the context of the affected resources.

**Chapter 5 – Consultation and Coordination** describes the public involvement and agency consultation and coordination processes that occurred during the GMP/EIS planning process.

**References and Legal Citations** identify sources from which background and supporting documentation was obtained.

**Appendices** provide additional supporting technical data and relevant background material cited throughout the plan.

A **Glossary** of terms used is provided.

An **Index** of key terms is provided for easy cross referencing.

CHAPTER 1

# PURPOSE AND NEED


**1.1** Protecting and Enhancing the Seashore Experience – A Long-Term Plan for Management ..... 1-1

**1.2** Seashore Overview ..... 1-4

**1.3** Relationship to Chincoteague National Wildlife Refuge ..... 1-12

**1.4** Guidance for Seashore Planning, Development, and Management ..... 1-18

**1.5** Planning Issues ..... 1-31

**1.6** Impact Topics ..... 1-37

**1.7** The Seashore's Wilderness ..... 1-45

**1.8** The Seashore's Boundary ..... 1-46

**1.9** Related Plans ..... 1-48

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# 1. PURPOSE AND NEED

## 1.1 Protecting and Enhancing the Seashore Experience – A Long-Term Plan for Management

Assateague Island National Seashore (the seashore) offers unique opportunities for a wide range of visitors to explore and enjoy one of the largest and last surviving natural barrier islands in the Mid-Atlantic coastal region of the United States. Established by Congress in September 1965 as a unit of the national park system, the seashore is composed of the 37-mile Assateague Island in Maryland and Virginia and the surrounding marine and estuarine waters up to one-half mile from the island's shore. The National Park Service (NPS) is responsible for managing the seashore to protect Assateague Island and its adjacent waters and small islands and to make available those resources for public outdoor recreation use and enjoyment. Within the seashore boundary are Assateague State Park (managed by the Maryland Department of Natural Resources (MD DNR)) and Chincoteague National Wildlife Refuge (CNWR) (managed by the U.S. Fish and Wildlife Service (FWS)).

The NPS manages all units of the national park system, in accordance with the mandate in its 1916 Organic Act and other legislation, to conserve resources unimpaired for the enjoyment of future generations. To help implement this mandate, the National Parks and Recreation Act of 1978 (PL 95-265) and *NPS Management Policies* (NPS 2006c) require each park unit to have a broad-scale general management plan (GMP). The GMP defines the park's basic approaches to natural and cultural resource management, interpretation, the visitor experience, and partnerships over the long-term.

The proposed federal action considered in this environmental impact statement (EIS) is the implementation of a new GMP/EIS for the seashore. This is the seashore's second plan and will replace the management guidance found in its first plan completed during the years following the seashore's establishment (NPS 1982).

### 1.1.1 PURPOSE OF THE PLAN

The purpose of the GMP/EIS is to provide a decision-making framework that ensures that management decisions effectively and efficiently carry out the NPS mission at Assateague Island National Seashore into the future. NPS managers at the seashore routinely make many difficult decisions about the preservation of the seashore's significant natural and cultural resources for public enjoyment, about competing demands for limited resources, about priorities for using available funds and staff, and about differing local and nationwide interests and views of what is most important at the seashore. The decision-making framework in the seashore's GMP/EIS will provide the guidance to make these management choices in a manner that is consistent with the purposes for which Assateague Island National Seashore was established by

Congress as a unit of the national park system and that protects the seashore's fundamental and other important resources and values.

### 1.1.2 NEED FOR THE PLAN

Many considerations suggest that a new GMP/EIS is needed for the seashore. The current GMP for the seashore is over 30 years old. The NPS has implemented many of its recommendations. Some are no longer appropriate because of changing conditions and circumstances. New issues have emerged in recent years that the current GMP does not address because they were not anticipated in 1982 when the plan was prepared. Also, recent NPS policies related to management and planning for all national park units have changed since 1982.

The new GMP/EIS for Assateague Island National Seashore also addresses several needs:

- It ensures that the seashore's fundamental and other important resources and values are preserved and protected.
- It provides a management framework for responding to catastrophic storms and the effects of climate change/sea level rise.
- It meets NPS policy requirements for comprehensive general management planning as a guide for more specific projects, to base decisions on adequate environmental information and analysis, and to track progress toward goals.
- It provides a logical trackable rationale for decision-making by the NPS that focuses first on why the seashore was established and what the desired future conditions of those resources should be.
- It considers the concerns, expectations, and values of the public and of the states of Maryland and Virginia related to management of resources and visitor experience.
- It ensures that management decisions by the NPS promote the efficient use of public funds and that managers are accountable to the public for their management decisions.

### 1.1.3 PLAN DEVELOPMENT

The NPS planning team – led by the seashore's staff – has prepared the Draft GMP/EIS. The planning team generally followed NPS planning program standards presented in the *General Management Planning Dynamic Sourcebook* (NPS 2008b). The Draft GMP/EIS has been prepared in accordance with the Council on Environmental Quality's (CEQ's) implementing regulations for the National Environmental Policy Act (NEPA) (40 CFR 1500-1508) and NPS Director's Order #12, *Conservation Planning Environmental Impact Analysis, and Decision*-Making (DO-12) (NPS 2011e), and accompanying *DO-12 Handbook* (NPS 2001a). Some actions in the preferred alternative in the approved GMP/EIS may qualify as undertakings that would be subject to compliance with section 106 of the National Historic Preservation Act as actions are implemented in the future.

Figure 1.1
Regional Location
Assateague Island National Seashore Boundary
Assateague State Park Boundary
Chincoteague National Wildlife Refuge Boundary
Miles
0
10
20
40
PENNSYLVANIA
Philadelphia
Wilmington
NEW JERSEY
MARYLAND
Baltimore
Dover
DISTRICT OF COLUMBIA
Annapolis
DELAWARE
CHESAPEAKE BAY
WORCESTER COUNTY
Assateague Island National Seashore
MARYLAND
VIRGINIA
VIRGINIA
ACCOMACK COUNTY
Richmond
ATLANTIC OCEAN
Virginia Beach
95
301
50
13

The NPS, as the lead agency responsible for development of the Draft GMP/EIS, consulted with the FWS, the states of Maryland and Virginia, Indian tribes, and county, city, and town elected officials to prepare the plan. Numerous coordination meetings occurred (section 5.1). Periodically during the planning process there were opportunities for stakeholders and members of the public to participate in developing the plan and to provide comments on proposed management actions (section 5.1).

#### 1.1.4 NEXT STEPS AND PLAN IMPLEMENTATION

The Draft GMP/EIS for the seashore will be on public and agency review for 60 days following publication of the Environmental Protection Agency's Notice of Availability in the *Federal Register*. During the review period, the public will have opportunities to provide comments on the management alternatives, including the NPS preferred alternative. The NPS will hold public meetings where comments can be made. The public will also be able to comment on-line and by letter, which must be post marked by the due date posted on the NPS Planning, Environment, and Public Comment (PEPC) website. Information on how the public can provide comments and any public meetings that could be held during the review period will be available on the NPS PEPC web site and in news releases.

The NPS will review and evaluate all comments received on the Draft GMP/EIS. The results of the public and agency comments will be incorporated into a Final GMP/EIS that will be made available to the public for a 30-day no-action period, after which a Record of Decision may be prepared to document the selection of an alternative as the approved GMP/EIS for the seashore.

The Draft GMP/EIS presents an overview of potential actions and impacts related to the management concepts for the seashore. Once a GMP/EIS is approved, implementation of actions in the approved GMP/EIS will be subject to site-specific planning and compliance in accordance with all applicable requirements.

## 1.2 Seashore Overview

#### 1.2.1 SEASHORE ORIGIN AND LEGISLATIVE HISTORY

Long a favorite place for hunting, fishing, and beach recreation among the region's residents, Assateague Island first came to national attention in 1934. At that time, in an effort to provide the east coast's rapidly growing population with additional public recreational opportunities, the NPS surveyed lands along the Atlantic and Gulf coasts to identify areas for potential acquisition and administration as national seashores. Based on its natural qualities, recreational values, and proximity to major population centers, Assateague Island was one of 12 areas found to have potential as a public recreation area. Although several legislative bills were introduced in Congress in the 1940s, no action was taken to establish Assateague as a unit of the national park system at that time.

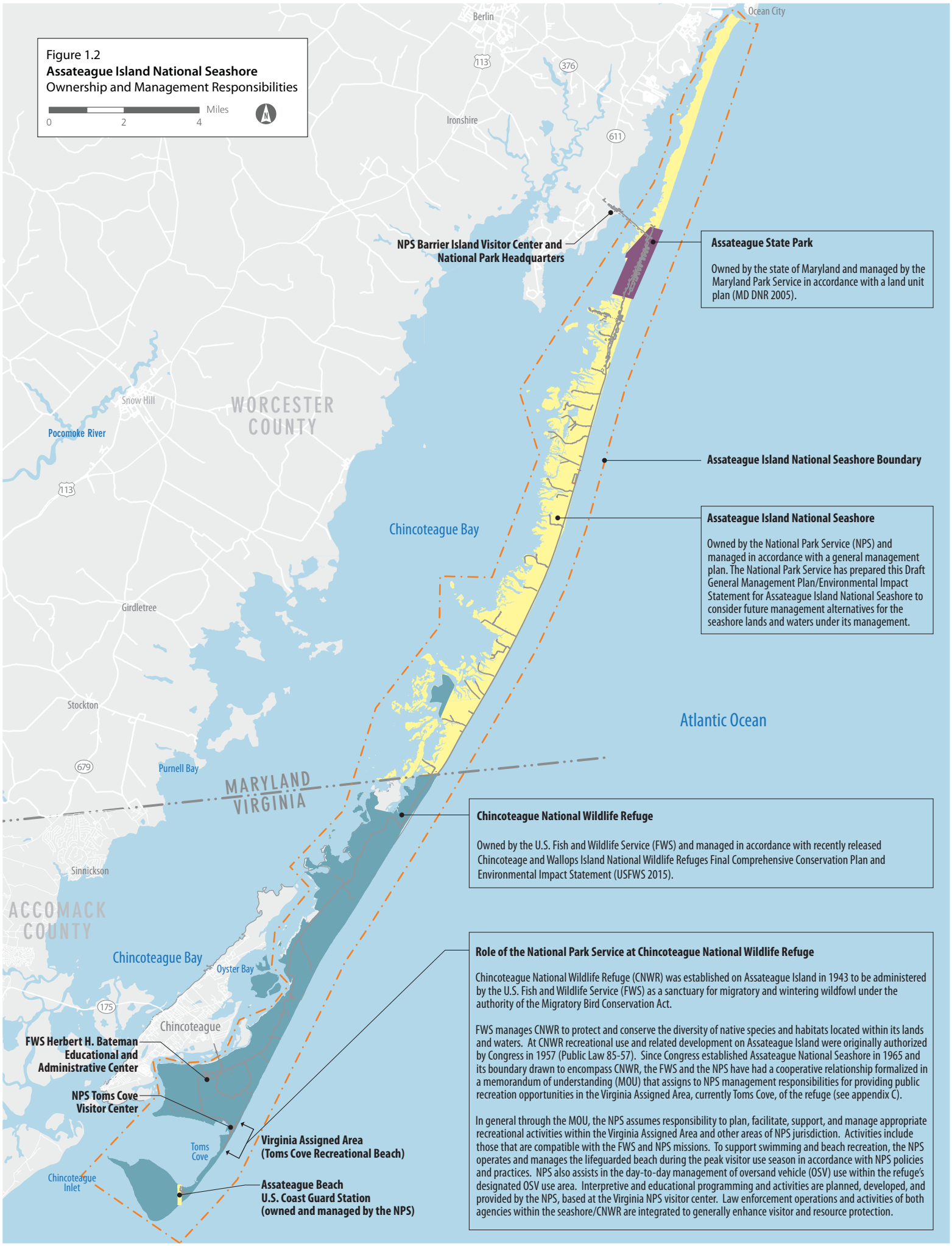
Figure 1.2
Assateague Island National Seashore
Ownership and Management Responsibilities
Miles
0
2
4
Berlin
Ocean City
113
376
Ironshire
611
NPS Barrier Island Visitor Center and National Park Headquarters
Assateague State Park
Owned by the state of Maryland and managed by the Maryland Park Service in accordance with a land unit plan (MD DNR 2005).
Snow Hill
WORCESTER COUNTY
Pocomoke River
113
Assateague Island National Seashore Boundary
Chincoteague Bay
Assateague Island National Seashore
Owned by the National Park Service (NPS) and managed in accordance with a general management plan. The National Park Service has prepared this Draft General Management Plan/Environmental Impact Statement for Assateague Island National Seashore to consider future management alternatives for the seashore lands and waters under its management.
Girdletree
Stockton
Atlantic Ocean
679
Purnell Bay
MARYLAND
VIRGINIA
Chincoteague National Wildlife Refuge
Owned by the U.S. Fish and Wildlife Service (FWS) and managed in accordance with recently released Chincoteage and Wallops Island National Wildlife Refuges Final Comprehensive Conservation Plan and Environmental Impact Statement (USFWS 2015).
Sinnickson
ACCOMACK COUNTY
Chincoteague Bay
Oyster Bay
175
Chincoteague
FWS Herbert H. Bateman Educational and Administrative Center
NPS Toms Cove Visitor Center
Toms Cove
Virginia Assigned Area (Toms Cove Recreational Beach)
Chincoteague Inlet
Assateague Beach U.S. Coast Guard Station (owned and managed by the NPS)
Role of the National Park Service at Chincoteague National Wildlife Refuge
Chincoteague National Wildlife Refuge (CNWR) was established on Assateague Island in 1943 to be administered by the U.S. Fish and Wildlife Service (FWS) as a sanctuary for migratory and wintering wildfowl under the authority of the Migratory Bird Conservation Act.
FWS manages CNWR to protect and conserve the diversity of native species and habitats located within its lands and waters. At CNWR recreational use and related development on Assateague Island were originally authorized by Congress in 1957 (Public Law 85-57). Since Congress established Assateague National Seashore in 1965 and its boundary drawn to encompass CNWR, the FWS and the NPS have had a cooperative relationship formalized in a memorandum of understanding (MOU) that assigns to NPS management responsibilities for providing public recreation opportunities in the Virginia Assigned Area, currently Toms Cove, of the refuge (see appendix C).
In general through the MOU, the NPS assumes responsibility to plan, facilitate, support, and manage appropriate recreational activities within the Virginia Assigned Area and other areas of NPS jurisdiction. Activities include those that are compatible with the FWS and NPS missions. To support swimming and beach recreation, the NPS operates and manages the lifeguarded beach during the peak visitor use season in accordance with NPS policies and practices. NPS also assists in the day-to-day management of oversand vehicle (OSV) use within the refuge's designated OSV use area. Interpretive and educational programming and activities are planned, developed, and provided by the NPS, based at the Virginia NPS visitor center. Law enforcement operations and activities of both agencies within the seashore/CNWR are integrated to generally enhance visitor and resource protection.

Further study in 1955 concluded that Assateague Island seemed increasingly unsuitable as a candidate for the national park system because of the rapid growth in private development on the island. Almost a decade later, the infamous Ash Wednesday nor'easter in March 1962 inundated the island, destroying much of the fledgling development and calling into question the wisdom of private development on Assateague Island.

Shortly after the storm, the Secretary of the Interior and the governor of Maryland issued results of a joint study to determine the best use of Assateague Island. Major factors listed by the report as justification for creating a national seashore included the growing demand for public seaside recreation, the infeasibility of private development, and the potential economic benefits to the local economy.

On September 21, 1965, Congress passed Public Law 89-195 (U.S.C. Title 16, Chapter 1, Subchapter LXIII, §459f) (appendix A) establishing Assateague Island National Seashore as a unit of the national park system, "For the purpose of protecting and developing Assateague Island in the states of Maryland and Virginia and certain adjacent waters and small marsh islands for public outdoor recreation use and enjoyment…" With this enabling legislation, Assateague Island became an important national resource serving the recreation needs of local regional, national, and international visitors and preserving in perpetuity 37 miles of Mid-Atlantic coastal environment.

Creation of the national seashore initiated acquisition of nearly 9,000 acres of privately owned lands on Assateague Island from some 3,500 individuals, and ten acres on the adjacent Maryland mainland for construction of an administrative facility. By the mid-1980s all of the land proposed for acquisition had been acquired. There remained, however, a private presence on the island in the form of retained rights of use and occupancy by 11 former property owners. These owners had negotiated twenty-five year leases allowing continued use of their former properties as part of the acquisition process. More than 1,000 acres of Assateague Island National Seashore were encumbered by private rights of use until the last of the leases expired in 2002.

Like much federal law, the seashore's enabling legislation contained a number of compromises reflecting the disparity of public and private interests. Of particular note, the legislation contained provisions for development of privately operated overnight accommodations and other recreational amenities on nearly 600 acres of the island. The legislation also authorized the construction of a paved road running the length of the island between the Sandy Point-Assateague Bridge in Maryland and the Chincoteague-Assateague Bridge in Virginia.

Both of these provisions proved extremely unpopular with local, regional and national conservation groups who began to mobilize public opposition. In 1969, the NPS released a one-page "Master Plan" that further stirred public reaction. The proposal

included plans for motels, restaurants, trailer spaces, fishing piers, a marina, and parking for more than 13,000 cars.

As the result of broad public and political disapproval of the proposed development plans, in 1976 Congress amended the legislation for Assateague and set a new path for the seashore. Public Law 94-578 deleted the provisions requiring private overnight accommodations and other conveniences, and construction of the road connecting the two ends of the island. The legislation also directed the NPS to prepare a "comprehensive plan" for the seashore to include "measures for the full protection and management of the natural resources and natural ecosystems of the seashore". The *Assateague Island National Seashore General Management Plan* (NPS 1982b) that resulted has guided management of the seashore to the present time.

### 1.2.2 SEASHORE BOUNDARY AND OWNERSHIP

Congress established the boundary of the seashore through the seashore's enabling legislation. The final authorized boundary extends up to one-half mile from the island in the states of Maryland and Virginia.

he boundary encompasses the entire island and its surrounding waters, including Assateague State Park in Maryland and Chincoteague National Wildlife Refuge in Virginia. Both these areas existed prior to establishment of the seashore and neither fall under NPS authority. The MD DNR manages Assateague State Park and FWS manages the Chincoteague National Wildlife Refuge.

The submerged lands within the seashore boundary remain owned by the states of Maryland and Virginia, with ownership extending to mean high water in Maryland, and mean low water in Virginia. Private leasing of submerged lands for shellfish culture and harvest is a common practice in the Virginia portion of the seashore. At present, there are no private submerged land leases in the Maryland portion of the seashore; these are prohibited within Maryland seashore waters.

### 1.2.3 REGIONAL CONTEXT

The seashore is located on the Atlantic coast of the Delmarva Peninsula and straddles the Maryland/Virginia state line. Nearly two-thirds of the seashore's 37 miles are within Worcester County, Maryland, with the balance in Accomack County, Virginia. Within a three-hour drive of the Washington/Baltimore/Philadelphia metropolitan area, the seashore provides outstanding recreational opportunities for millions of visitors annually.

The seashore is bounded on the east by the Atlantic Ocean and on the west by Sinepuxent and Chincoteague Bays. Most of the mainland adjacent to Assateague Island is rural, with agriculture and forestry being the predominant land uses. Population centers in Worcester County include the towns of Berlin, Snow Hill and Ocean City, Pocomoke City, and the unincorporated communities of Ocean Pines and West Ocean City. In 2010, the population of Worcester County was 51,454. Access to the Maryland end of Assateague Island is provided via state Route 611 and Verrazano Bridge.

In Accomack County, nearby population centers include the Town of Chincoteague and the unincorporated community of Captain's Cove. Noteworthy for its role as a local employer is the National Aeronautics and Space Administration's (NASA) Wallops Island Flight Facility, located on Wallops Island and the mainland adjacent to Chincoteague Island. In 2010, the population of Accomack County was 33,164. State Road 175 provides automobile access from the mainland to Chincoteague Island; from Chincoteague Island, two NPS-owned bridges provide access to Assateague Island.

To the north of Assateague lies Fenwick Island and the intensively developed resort town of Ocean City, Maryland. The popular summer destination swells from its winter population of 7,100 to more than 250,000 during busy summer weekends. The seashore has traditionally been a secondary day-trip destination for many of the visitors to Ocean City.

The town of Chincoteague is adjacent to the southern end of Assateague Island and serves as a gateway to the seashore and Chincoteague National Wildlife Refuge in Virginia. During the summer months, the small island community of some 4,300 permanent residents becomes a very popular tourist destination, in large part due to the seashore and the refuge.

### 1.2.4 NATURAL RESOURCES

The seashore's natural resources include diverse wildlife, plant communities, geological features, and physical processes typical of the land/sea interface along the Mid-Atlantic coast. Wildlife resources range from a myriad of aquatic and terrestrial invertebrate species inhabiting the estuaries formed by the island to the free-roaming horses for which Assateague is famous. Native plant communities exhibit the adaptive extremes necessary for survival on a barrier island, where exposure to salt spray, lack of freshwater, and shifting sands create a harsh and dynamic environment. Throughout the seashore, the relationship of land and water is paramount.

Many of the island's terrestrial habitats are in a constant state of flux as storms and other natural coastal processes alter physical conditions and continually reshape biological communities. As sea levels have risen over past centuries, the island has responded by "migrating" landward and creating new lands through overwash and inlet formation processes. During times of infrequent storms, communities that required more stable conditions have flourished. When powerful storms returned, those communities have declined while others more adept at weathering disturbance thrived and expanded.

Despite the often harsh and extreme environmental conditions, many animals find a niche on Assateague Island. Each of the island's different ecological zones provides habitat for birds, mammals, reptiles, amphibians, and invertebrates. While Assateague's wild horses are, perhaps, the seashore's best known residents, the island also supports two other large mammals: the native white-tailed deer (*Odocoileus virginianus*) and the non-native sika deer (C*ervus japonica*), a diminutive species of Asian elk introduced during the 1920s.

Other resident species are less obvious. Six species of frogs and toads depend on the island's fresh water ponds and wetlands for breeding, and a variety of snakes such as the black rat snake (*Elaphe obsoleta obsoleta*) occur in the island's forest, dune, and marsh habitats. Numerous invertebrates like fiddler crabs (*Uca sp.*) and mud snails (*Nassarius sp.*) find suitable conditions in the bayside salt marshes and play a key role in maintaining the health of these habitats. Even the seemingly barren beaches provide habitat for nocturnal ghost crabs (*Ocypode quadrata*), red fox (*Vulpes vulpes*), and raccoons (*Procyon lotor*) to scavenge for crustaceans, dead fish, and other organic matter washed in by the tides.

The seashore also provides important habitat for a number of federally listed threatened and endangered species. Although most are occasional transients, several listed species occur as residents or regularly use the island for breeding. Most notable are the piping plover (*Charadrius melodus*), a small, ground-nesting migratory shorebird, and sea beach amaranth (*Amaranthus pumilus*), a pioneering plant of ocean beach habitats. In addition, loggerhead sea turtles (*Caretta caretta*) occasionally use the

island's beaches for nesting. The seashore's storm-shaped beaches have become increasingly important to regional biodiversity as shore stabilization activities elsewhere along the Mid-Atlantic coast have limited the extent of natural beaches.

The seashore supports many other bird species throughout the year. Its location along the Atlantic coast flyway makes the protected environment of Assateague Island especially important for migratory birds. The island is renowned for the autumn migration of peregrine falcons (*Falco peregrinus*), and for the seasonal abundance of shorebirds and wintering waterfowl. In recognition of its value to bird life, the seashore has been designated a globally important bird area (IBA) by the National Audubon Society.

Of particular significance are the marine, estuarine, and wetland habitats which compose more than 75 percent of the seashore. From near-shore ocean to sheltered estuary, the seashore includes an array of aquatic habitats including abundant sea grass beds, expansive salt marshes, and a mosaic of sandy shallows and intertidal flats. These protected habitats sustain a rich marine life, ranging from small sedentary plants and invertebrates to large ocean-going marine mammals. Some aquatic habitats, like the island's bayside salt marshes, play a key role in supporting regional ecosystem health by filtering pollutants, providing storm protection for adjacent uplands, and through the production of organic materials that fuel the estuarine food web.

During most nights at the seashore, astronomical features including the Milky Way and Beehive Clusters are readily observed. In general, natural ambient sound levels are low in most areas of the seashore, except where high levels of natural sounds emanate from the surf along the ocean beach. Human-made sounds are also low, emanating from seashore operations, visitor activities, traffic on seashore roads, oversand vehicle (OSV) use, and powerboats.

### 1.2.5 CULTURAL RESOURCES

Assateague Island National Seashore contains a variety of locally, regionally, and nationally significant cultural resources, ranging from historic structures to archeological objects and sites. Historic structures and archeological sites make up the majority of the cultural resources found on Assateague Island. These structures and sites, as well as the associated objects and documents, are all that remain from the relatively brief periods when humans occupied Assateague Island. In all, the cultural resources tell a story of man's inability to establish a permanent foothold on the dynamic barrier island and are important links to both the history and purpose of the seashore.

All of Assateague Island is a cultural landscape determined to be a representative Atlantic coast barrier island. The landscape encompasses the full range of natural resources found on the island, in the water, and on the marshes surrounding the island.

It exemplifies the continual changes that occur along a barrier island of the Mid-Atlantic Coast, where extraordinarily dynamic geomorphological processes occur.

The structures that compose the Assateague Beach U.S. Coast Guard Station are the seashore's most significant historic structures and the landscape associated with the station is the seashore's most significant cultural landscape. The U.S. Coast Guard operated the station from the time it was built in 1922 until 1967 when it was decommissioned. The station and its five associated structures have been determined eligible for listing on the *National Register of Historic Places*.

Within the seashore boundaries there are eight former waterfowl hunting lodge properties and two former private residences where hunting rarely if ever occurred. Green Run Lodge is the only former lodge which has been found to be historically significant and has been determined eligible for listing on the *National Register of Historic Places.*

Terrestrial archeological sites found within the seashore are primarily related to historic operations of the U.S. Lifesaving Service and several small residential and commercial developments dating from the late nineteenth and mid twentieth centuries. The remains of shipwrecks are also known within the seashore boundary. The presence or absence of prehistoric archeological sites has not been systematically investigated. The majority of the seashore's museum collection is composed of natural history voucher specimens or other objects relating to the area's natural resources.

#### 1.2.6 VISITOR EXPERIENCE AND VISITOR USE

Visited by millions annually, the seashore provides an oasis of relaxation, enjoyment, recreation, and hands-on learning experiences. Assateague Island is one of the few publicly accessible natural coastal environments in the densely populated northeastern United States where visitors can experience unspoiled beaches, tranquil bays and marshlands, natural sounds, quiet, dark night skies, and solitude.

Approximately 60 percent of visitation to the seashore takes place during the summer months of May through September. The average visitor is 46 years old, Caucasian, and female. Most visitors are in family groups with an average size of five people. Most visitors (87%) are from out of town, most traveling from Pennsylvania, New Jersey, and other parts of Maryland and Virginia.

Virtually every visitor to the seashore has some type of recreational activity in mind, including swimming, beach combing, camping, kayaking, hiking, beach driving, and/or viewing shorebirds and ponies. Only hunting and fishing are mandated by the seashore's enabling legislation and these traditional activities remain popular among both local and regional visitors. Adventure tourism is on the rise, providing visitors with new opportunities for a more intimate experience and greater exposure to the seashore's resources.

The seashore also offers exceptional opportunities for learning and education. The seashore's two visitor centers provide formal and informal learning experiences, and support a variety of curriculum-based educational programs for local school children. Among the many programs offered to the visiting public are aquarium talks, beach walks, bay seining programs, children's programs, surf fishing demonstrations, crabbing and clamming demonstrations, and kayak excursions.

## 1.3 Relationship to Chincoteague National Wildlife Refuge

#### 1.3.1 REFUGE ESTABLISHMENT AND OVERVIEW

Chincoteague National Wildlife Refuge (CNWR) was established on Assateague Island in 1943 to be administered by the FWS as a sanctuary for migratory and wintering wildfowl under the authority of the Migratory Bird Conservation Act. CNWR is part of the National Wildlife Refuge System – a system of public lands set aside for habitat and wildlife conservation. More than 150 million acres in over 550 national wildlife refuges compose the system. FWS manages its refuges "to maintain the biological integrity, diversity and environmental health of these natural resources for the benefit of present and future generations." While conservation and management of wildlife and its habitats are the main objectives of the refuge system, FWS also maintains six wildlife-dependent uses that receive enhanced consideration in planning public recreation on

refuges when appropriate: hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation.

FWS manages CNWR to protect and conserve the diversity of native species and habitats located within its lands and waters. Specifically important is critical habitat for migratory waterfowl and shorebirds. CNWR's environmental management tasks also support conservation and protection of threatened or endangered species such as the piping plover (*Charadrius melodus*), Delmarva Peninsula fox squirrel (*Sciurus niger cinereus*), loggerhead turtle (*Caretta caretta*), and sea beach amaranth (*Amaranthus pumilus*), and of the habitat that supports hundreds of other species of flora and fauna. In addition, CNWR allows feral ponies to graze in two areas of CNWR through a special use permit with their owners – the Chincoteague Volunteer Fire Company.

### 1.3.2 RECREATIONAL USE AT THE REFUGE

- **Need for Public Recreational Use**

Recreational use may be allowed in national wildlife refuges when such uses do not interfere with the area's primary purposes. At CNWR, recreational use and related development on Assateague Island were originally authorized by Congress in 1957 (Public Law 85-57). In 1959, the Department of the Interior granted to the Chincoteague-Assateague Bridge and Beach Authority – a political subdivision of the commonwealth of Virginia – an easement to build a bridge to the refuge and a roadway across it to the Toms Cove hook area. Coincident with the easement, the FWS entered into an agreement with the Beach Authority allowing development and operation of public beach and recreational facilities. These actions were taken in recognition of the need for public recreational facilities on the Virginia portion of Assateague Island and under the assumption that public recreational use of a certain portion of the refuge (subsequently referred to as the Virginia Assigned Area) could be permitted without preventing accomplishment of the conservation purposes for which CNWR was established.

When Congress established Assateague National Seashore in 1965 and its boundary drawn to encompass CNWR, the Department of the Interior was authorized to acquire all of the rights and legal interests of the Chincoteague-Assateague Bridge and Beach Authority, including its real and personal property. This acquisition was accomplished with NPS appropriations in 1966. At that time, the former Beach Authority easements merged with the United States' overall ownership interests on Assateague Island. Since that time the NPS has managed recreation activities in the Virginia Assigned Area in accordance with a memorandum of understanding with the FWS (appendix B).

- **Providing Opportunities for Public Recreational Use through Interagency Cooperation**

The enabling legislation for Assateague Island National Seashore directs the Department of the Interior to administer the seashore for the general purposes of outdoor public recreation (appendix A). The Secretary of the Interior has interpreted this to direct the NPS to aid the FWS in providing public recreation within the boundaries of CWNR. In 1966 and again in 1967, the Secretary of the Interior found that it was "desirable that the Service and Bureau share responsibilities…" for the beach-related recreation in the refuge. NPS was directed to take responsibility for management of the recreational beach, provision of lifeguard services, interpretation, visitor protection, maintenance of recreational beach facilities and other work. Consequently, the FWS has conveyed primary jurisdiction for beach use and recreation in the refuge to the NPS. The two agencies work together to minimize adverse impacts from these uses to the refuge. NPS is authorized to make available opportunities for public recreation at the Virginia Assigned Area in compliance with applicable national wildlife refuge laws and regulations, such as the Refuge Recreation Act, the National Wildlife System Administration Act, and the National Wildlife Refuge System Improvement Act.

Since 1966 the FWS and the NPS have had a cooperative relationship formalized in a memorandum of understanding (MOU) that assigns management responsibilities for

providing public recreation opportunities in the Virginia Assigned Area of the refuge (currently at Toms Cove Recreational Beach) (figure 1.2 and appendix B). Management objectives are:

- to protect and enhance refuge and seashore resources, as well as the appropriate enjoyment and appreciation by the public
- to provide high quality recreational, interpretive, and educational opportunities for the visiting public
- to reduce confusion regarding each agency's roles and responsibilities
- to eliminate unnecessary duplication of services, permitting, paperwork, and reviews
- to effectively utilize the experience, skills, and expertise of the two agencies' personnel

The MOU identifies actions both agencies will implement to accomplish the management objectives pertaining to visitor services, interpretive services, visitor and resource protection, facility management, land and resource management, and interagency communications and information sharing.

In general through the MOU, the NPS assumes responsibility to plan, facilitate, support, and manage appropriate recreational activities within the Virginia Assigned Area and other areas of NPS jurisdiction. Activities include those that are compatible with the FWS and NPS missions. To support swimming and beach recreation, the NPS operates and manages the lifeguarded beach at Toms Cove during the peak visitor use season in accordance with NPS policies and practices. NPS also assists in the day-to-day management of OSV use within the refuge's designated OSV use area. Interpretive and educational programming and activities are planned, developed, and provided by the NPS, based at the Virginia NPS visitor center. Law enforcement operations and activities of both agencies are integrated to generally enhance visitor and resource protection.

### 1.3.3 *DRAFT COMPREHENSIVE CONSERVATION PLAN AND ENVIRONMENTAL IMPACT STATEMENT FOR CHINCOTEAGUE AND WALLOPS ISLAND NATIONAL WILDLIFE REFUGES*

The National Wildlife Refuge System Improvement Act of 1997 requires the FWS to manage each of its refuges in accordance with a comprehensive conservation plan (CCP). CCPs describe future conditions of a refuge and provide long-range guidance and management direction to achieve the purpose of the refuge, refuge policy requirements, and the mission of the national wildlife refuge system. In planning for public recreation on refuges there are six priority wildlife-dependent uses that receive primary consideration: hunting, fishing, birding, photography, environmental education, and interpretation.

In September 2010 CNWR began the planning process for developing its first CCP. The new plan provides an updated management framework for the refuge for 15 years,

replacing guidance found in the *Master Plan for Chincoteague National Wildlife Refug*e (US FWS 1993). The CNWR planning team involved the NPS as a stakeholder in the CCP planning process, including seashore staff in numerous scoping meetings and public meetings. The *Draft Comprehensive Conservation Plan and Environmental Impact Statement for Chincoteague and Wallops Island National Wildlife Refuges* (US FWS 2014) was released to the public in May 2014; the public comment period closed August 15, 2014. A final plan (Final CCP/EIS) was released in August 2015, and a record of decision was signed on November 6, 2015.

The NPS would continue to support beach-oriented recreational uses in the island developed area within Chincoteague National Wildlife Refuge in Virginia. NPS would continue to manage the recreational beach in accordance with the memorandum of understanding between the NPS and the FWS (see appendix B). The Final CCP/EIS's preferred alternative supports continuation of the recreational beach with 961 automobile parking spaces to be managed by the NPS (US FWS 2015, page 2-51). The Final CCP/EIS's preferred alternative finds that, "In recognition of the vulnerability of the current parking, the refuge would develop and implement a site design plan for parking and access to a new beach location, approximately 1.5 miles north of the existing beach…The new recreational beach would offer accessible parking in close proximity to the beach. " (US FWS 2015, page 2-51)The Final CCP/EIS's preferred alternative proposes that the transition to the new recreational beach location would occur within eight years or sooner if funding were available (US FWS 2015, page 2-69). In the meantime, NPS would maintain beach recreation and parking at the current location, so long as the land base is available to support this use. Facilities and infrastructure supporting recreation include access roads and parking lots, shade shelters, rest rooms, changing rooms, rinse off showers, and interpretive programs. Until the beach moves, NPS would maintain the Toms Cove Visitor Center. When the beach location is moved northward, a new joint NPS and FWS visitor contact station would be developed (US FWS 2015, page 2-51). After the new joint visitor contact stations is opened, NPS and FWS may continue to operate environmental education programs from the Toms Cove Visitor Center, as long as that center remains serviceable and can be maintained economically. Eventually the current Toms Cove Visitor Center will be removed when it is no longer possible to maintain it in the face of sea level rise.

NPS would work with the FWS, the town of Chincoteague, Accomack County and others to design the new recreational beach sensitively, to respond to both the natural environment and the needs of the area's visitors. The beach experience, while different from that at the current location, would be designed to engage visitors and provide the kind of recreational opportunity for which the region has justifiably become famous. Careful attention to the design of parking for cars, RVs and buses, boardwalks, accessibility, changing stalls, rinse-off facilities, vault toilets, shelter areas, and other related needs would ensure a quality experience at the new beach location. The Final CCP/EIS's preferred alternative also proposes the management of biting insects to help

ensure a positive visitor experience. (US FWS 2015, 2-70). Critical to the success of the new design will be finding an appropriate balance between visitor experience and resiliency from future storms.

The relocation of the recreational beach might change the availability and mix of interpretive opportunities provided by NPS. NPS would work with FWS in the new joint visitor facility to provide appropriate and meaningful interpretive activities for visitors that take full advantage of the new location and the new preferred alternatives for Beach Road Terminus and Toms Cove Bay.

OSV use in Virginia would be as determined by the FWS. FWS proposes to develop a new ½ mile OSV zone to facilitate priority wildlife-dependent uses south of the new recreational beach from March 15 through September 15. FWS would continue current management of the Overwash and Hook area for shorebirds until the new recreational beach is established, at which time the March 15 through September 15 closure would go into effect. OSV access from September 16 to March 14 annually would continue via Beach Road. NPS would cooperate with FWS to provide OSV access.

## 1.4 Guidance for Seashore Planning, Development, and Management

This guidance section presents the core elements of the seashore's foundation document which the NPS will prepare in the future as a standalone document. The foundation document will provide the basic guidance for planning and management decisions—a foundation for planning and management at the seashore. The core foundation components include the seashore's purpose, significance, fundamental resources and values, other important resources and values, and interpretive themes. The foundation document will also include special mandates and administrative commitments, an assessment of planning and data needs that identifies planning issues, planning products to be developed, and the associated studies and data required for park planning. Along with the core components, the assessment provides a focus for park planning activities and establishes a baseline from which planning documents are developed.

Different levels and kinds of planning can be integrated and coordinated through the shared understanding presented in the foundation document about what is most important about a park. The document can be used in all aspects of park management to help ensure that the most important objectives are accomplished before turning to items that are not directly critical to achieving the park purpose and maintaining its significance.

### 1.4.1 SEASHORE PURPOSE

The seashore's purpose statement identifies the specific reasons for the seashore's establishment. It was drafted following careful analysis of the seashore's enabling legislation (appendix A) and the legislative history that influenced its development. The purpose statement lays the foundation for understanding what is most important about the seashore. It is as follows:

> *The purpose of Assateague Island National Seashore is to preserve the outstanding Mid-Atlantic coastal resources of Assateague Island and its adjacent waters and the natural processes upon which they depend, and to provide high quality resource-compatible recreational opportunities.*

### 1.4.2 SEASHORE SIGNIFICANCE

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

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

- The seashore is one of the largest and last surviving Mid-Atlantic barrier islands possessing a continuum of intact coastal habitats where the full range of natural processes occur with little or no human interference.
- The marine and estuarine waters within the seashore are a protected vestige of the high quality aquatic ecosystems that once occurred throughout the Mid-Atlantic coastal region of the United States.
- The seashore's habitats support a broad array of aquatic and terrestrial species, many of which are rare, uniquely adapted to life at the edge of the sea, and dependent upon natural ecosystem processes undisturbed by humans.
- Amidst the highly developed Mid-Atlantic region, the seashore's coastal resources provide unique opportunities for nature-based recreation, education, solitude, and inspiration.

### 1.4.3 SEASHORE RESOURCES AND VALUES

- **Fundamental Resources and Values**

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

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

**Barrier Island Habitats and Species**. The unique environmental conditions found on Assateague Island are reflected in the dynamic continuum of habitats stretching from ocean to bay, including beaches, dunes, grass and shrublands, freshwater wetlands, maritime forests, and salt marshes. The diverse landscape provides habitat for a multitude of specialized plant and animal species, many of which are rare, threatened, or endangered. Abundant and diverse populations of migratory birds – such as raptors, shorebirds, waterfowl, and neo-tropical migrants – use the seashore seasonally for breeding, overwintering, and as stopover habitat while moving along the coastal route of the Atlantic Flyway.

**High Quality Waters**. High quality water resources within the seashore's boundary define and sustain the coastal ecosystem and include fresh ground water and surface water systems, and extensive estuarine and marine waters. The physical, chemical and hydrologic properties and dynamics of seashore waters remain largely unaffected by human activities. These waters support the primary recreational activities within the seashore as well as a diverse array of biological communities.

**Natural Coastal Processes**. Natural processes including the action of tides, wind, waves, currents, storms, and sea level rise influence and shape the terrain of the barrier island and adjacent aquatic habitats. These dynamic natural forces create the unique habitats and influence the flora and fauna that serve as key features of the barrier island ecosystem. These processes also drive the constant erosion and accretion that have the potential to dramatically alter the fundamental aspects of the seashore landscape.

**Aquatic Habitats and Species**. From open ocean to protected estuary, the seashore includes a diverse array of aquatic habitats including abundant sea grass beds, expansive

salt marshes, and a mosaic of sandy shallows and intertidal flats. These protected habitats support a rich marine life, ranging from small sedentary plants and invertebrates to large ocean-going marine mammals.

**Natural Coastal Environment**. The natural coastal environment of the seashore exemplifies the meeting place of land and sea along the Mid-Atlantic coast, and includes miles of broad sandy beaches, an intricate mosaic of natural and scenic landscape features, and qualities of wilderness character.

**Visitor Experiences at the Seashore.** The natural resources of the seashore provide visitors with a wide variety of active and passive recreational and educational opportunities. Expansive seascapes of ocean and bay, panoramic views, natural sounds, inviting waters, ocean breezes, and dark night skies provide a dramatic setting for an exceptional seashore experience. Visitors have the opportunity to experience the seashore in a variety of ways from walking on the beach to counting the stars by a camp fire, and from ranger guided educational activities to self-guided explorations.

- **Other Important Resources**

The seashore contains other resources and values that are not fundamental to the purpose of the seashore and may be unrelated to its significance, but are important to consider in planning processes. These are referred to as "other important resources and values". These resources and values are important in the operation and management of the seashore and warrant special consideration in seashore planning.

**Horses**. Horses have been present on Assateague Island for hundreds of years, although they are not native to the island. The seashore provides a unique opportunity to view wild horses in a natural setting, and a majority of visitors indicate that seeing horses is one of the primary reasons for visiting Assateague Island.

**Cultural Resources**. The seashore contains a variety of locally, regionally, and nationally significant cultural resources, ranging from historic structures to archeological objects and sites. These structures and sites, as well as the associated documents and objects, are all that remain from the relatively brief periods when humans occupied Assateague

Island. Two structures have been determined eligible for listing in the *National Register of Historic Places:*

- The Assateague Beach U.S. Coast Guard Station is architecturally significant as a representative example of early 20th century U.S. Coast Guard buildings constructed primarily to execute the boat and life-saving service along the Atlantic Coast. It is also a Virginia state landmark.
- Green Run Lodge is significant as a representative example of waterfowl hunting camps associated with historical commercial and recreational hunting on Assateague Island.

Combined, the seashore's cultural resources tell the story of mankind's inability to establish a permanent foothold on the constantly changing barrier island.

- **Related Resources**

Related resources are not owned by the NPS. They may be part of the broader context or setting in which the seashore's resources exist; represent a thematic connection that would enhance the experience of visitors; or have close associations with the seashore's fundamental resources and the purpose of the seashore.

**Chincoteague and Sinepuxent Bays and Atlantic Ocean**. The waters and mainland watershed of Chincoteague and Sinepuxent Bays and Atlantic Ocean extend far beyond seashore boundaries. The integrity of many fundamental resources is affected by activities that occur outside of the seashore, but within the watershed.

### 1.4.4 INTERPRETIVE THEMES

Interpretive themes are the key stories or concepts that visitors should understand after visiting the seashore – they define the most important ideas or concepts communicated to visitors about the seashore. Themes are derived from, and reflect, the seashore's purpose, significance, resources, and values. The set of interpretive themes (table 1.1) provides the structure necessary for seashore staff to develop opportunities for visitors to explore and relate to the seashore's significance statements and fundamental and other important resources and values.

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

**Table 1.1. Interpretive Themes**

| Theme | Theme Statement |
|---|---|
| **Island on the Move** | Change is the only constant on Assateague Island as wind and water move and transform the land and its plant and animal communities. Adapting to change on a barrier island is the key to survival in this place where dynamic forces control the process of life. |
| **Aquatic Legacies** | Assateague's shoreline is a constantly shifting boundary between land and water where we connect to the rest of the world through a shared ocean resource which provides oxygen, food, habitat, livelihood, recreation, and glimpses of our past. There is just one intermingled and irreplaceable ocean that sustains these aspects of life on earth. |
| **People and Place** | People have long relied on Assateague Island for survival, livelihood, community, and enjoyment. Those who have spent time on and around the island have changed it and been changed by it. |
| **Recreation and Stewardship** | Assateague Island provides a diverse range of recreational opportunities which are compatible with the National Park Service's dual mission of conservation and public access. Immersion in an unspoiled natural setting cultivates profound experiences and special memories, the foundation of a stewardship ethic. |

### 1.4.5 LEGISLATIVE MANDATES AND SPECIAL DESIGNATIONS

A number of legislative mandates (table 1.2) and other special mandates (table 1.3) provide additional direction as to how the seashore is to be managed.

Several federal natural resource management programs have also designated Assateague Island National Seashore and its associated wildlife and habitat as areas of special management interest (table 1.4). These designations generally require elevated review of federal and state actions that have the potential to impact significant seashore-related resources and values. They also generally mandate avoidance or minimization of impacts on special resources.

**Table 1.2 Assateague Island National Seashore – Legislative Mandates[1]**

| Legislative Reference | Subject | Mandate |
|---|---|---|
| **§459f–2(b)** | **State Ownership of Land within the Seashore Boundary** | The State of Maryland shall have the right to acquire or lease from the United States such lands, or interests therein, on the island north of the area now used as a state park as the State may from time to time determine to be needed for state park purposes, and the Secretary is authorized and directed to convey or lease such lands, or interests therein, to the State for such purposes upon terms and conditions which he deems will assure its public use in harmony with the purposes of sections 459f to 459f–11 of this title. In the event any of such terms and conditions are not complied with, all the property, or any portion thereof, shall, at the option of the Secretary, revert to the United States, in its then existing condition. Any lease hereunder shall be for such consideration as the Secretary deems equitable; and any conveyance of title to land hereunder may be made only upon payment by the State of such amounts of money as were expended by the United States to acquire such land, or interests therein, and upon payments of such amounts as will reimburse the United States for the cost of any improvements placed thereon by the United States, including the cost to it of beach protection: *Provided*, That reimbursement for beach protection shall not exceed 30 per centum, as determined by the Secretary, of the total cost of the United States of such protection work. |
| **§459f–4** | **Hunting and Fishing** | The Secretary shall permit hunting and fishing on land and waters under his control within the seashore in accordance with the appropriate state laws, to the extent applicable, except that the Secretary may designate zones where, and establish periods when, no hunting or fishing shall be permitted for reasons of public safety, administration, fish or wildlife management or public use and enjoyment: *Provided*, That nothing in sections 459f to 459f–11 of this title, shall limit or interfere with the authority of the States to permit or to regulate shellfishing in any waters included in the national seashore: *Provided further*, That nothing in said sections shall add to or limit the authority of the Federal Government in its administration of Federal laws regulating migratory waterfowl. Except in emergencies, any regulations of the Secretary pursuant to this section shall be put into effect only after consultation with the appropriate state agency responsible for hunting and fishing activities. The provisions of this section shall not apply to the Chincoteague National Wildlife Refuge. |
| **§459f–5(b)** | **Management of National Wildlife Refuge Lands** | Notwithstanding any other provision of sections 459f to 459f–11 of this title, land and waters in the Chincoteague National Wildlife Refuge, which are a part of the seashore, shall be administered for refuge purposes under laws and regulations applicable to national wildlife refuges, including administration for public recreation uses in accordance with the provisions of the Act of September 28, 1962 (Public law 87–714; 76 Stat. 653) [16 U.S.C. 460k et seq.]. |
| **§459f–5(c)** | **Research and Technical Assistance to Protect Seashore Resources** | The Secretary is authorized to enter into cooperative agreements with local, state, and federal agencies and with educational institutions and nonprofit entities to coordinate research designed to ensure full protection of the natural and cultural resources of the seashore, consistent with the purposes for which the seashore was established, and other applicable law. The Secretary is also authorized to provide technical assistance to local, state, and federal agencies and to educational institutions and non-profit entities in order to further such purposes. The Secretary shall submit a report every two years to the Congress on the results of the coordinated research program authorized by this section and plans to implement the recommendations arising from such research. |

**Table 1.2 Assateague Island National Seashore – Legislative Mandates[1] (continued)**

| Legislative Reference | Subject | Mandate |
|---|---|---|
| **§459f–5(a)** | **Public Outdoor Recreation** | Except as provided in subsection (b) of this section, the Secretary shall administer the Assateague Island National Seashore for general purposes of public outdoor recreation, including conservation of natural features contributing to public enjoyment. In the administration of the seashore and the administrative site the Secretary may utilize such statutory authorities relating to areas administered and supervised by the Secretary through the National Park Service and such statutory authority otherwise available to him for the conservation and management of natural resources as he deems appropriate to carry out the purposes of sections 459f to 459f–11 of this title. |
| **§459f–5(b)** | **Refuge Land and Waters** | Notwithstanding any other provision of sections 459f to 459f–11 of this title, land and waters in the Chincoteague National Wildlife Refuge, which are a part of the seashore, shall be administered for refuge purposes under laws and regulations applicable to national wildlife refuges, including administration for public recreation uses in accordance with the provisions of the Act of September 28, 1962 (Public law 87–714; 76 Stat. 653) [16 U.S.C. 460k et seq.]. |
| **§459f–7** | **Beach Erosion Control and Storm Protection** | The Secretary of the Interior and the Secretary of the Army shall cooperate in the study and formulation of plans for beach erosion control and hurricane protection of the seashore; and any such protective works that are undertaken by the Chief of Engineers, Department of the Army, shall be carried out in accordance with a plan that is acceptable to the Secretary of the Interior and is consistent with the purposes of sections 459f to 459f–11 of this title. |
| **§459f–11(a)** | **Comprehensive Plan for Seashore Management** | Within two years of October 21, 1976, the Secretary shall develop and transmit to the Committees on Interior and Insular Affairs of the Senate and the House of Representatives a comprehensive plan for the protection, management, and use of the seashore, to include but not be limited to the following considerations:<br>(1) measures for the full protection and management of the natural resources and natural ecosystems of the seashore;<br>(2) present and proposed uses of the seashore and the lands and waters adjacent or related thereto, the uses of which would reasonably be expected to influence the administration, use, and environmental quality of the seashore;<br>(3) plans for the development of facilities necessary and appropriate for visitor use and enjoyment of the seashore, with identification of resource and user carrying capacities, along with the anticipated costs for all proposed development;<br>(4) plans for visitor transportation systems integrated and coordinated with lands and facilities adjacent to, but outside of, the seashore; and<br>(5) plans for fostering the development of cooperative agreements and land and resource use patterns outside the seashore which would be compatible with the protection and management of the seashore. |

[1] *Other mandates found in the seashore's enabling legislation have been satisfied (including those found in §459f-1(a), 1(b), 1(c), 1(d), 2(a), 3, and 9) or repealed (including those found in §459f-6 and 8).*

**Table 1.3 Assateague Island National Seashore – Other Special Mandates**

| Party with Whom Agreement Exists | Type of Agreement and General Provisions |
|---|---|
| **U.S. Fish and Wildlife Service (2012)** | Agreement that assigns management responsibilities for providing recreation opportunities in the Virginia Assigned Area of CNWR; addresses visitor services, interpretive services, visitor and resource protection, facility management, land and resource management, and interagency communications and information sharing *(see section 1.3.2 and appendix B)* |
| **U.S. Army Corps of Engineers (2001)** | Agreement regarding restoration of the north end of Assateague Island mandating joint management and funding of north end restoration and adaptive management activities *(see section 1.10.5)* |
| **Kingdom of Spain (2001)** | Agreement for loan of maritime artifacts which requires conservation and protection of loaned artifacts, permits use of artifacts in visitor center displays, and requires consultation in any publications regarding artifacts |

### 1.4.6 OTHER LEGISLATIVE AND POLICY REQUIREMENTS

The *NPS Management Policies* (NPS 2006c) and a number of federal laws, acts, and executive orders vital to the NPS mission also guide management of the seashore as a unit of the national park system. Collectively these policies and servicewide laws define the conditions desired in national parks and ensure that parks are managed in accordance with national regulations consistently applied to all parks in the system. In addition, the laws of the state of Maryland and the commonwealth of Virginia apply to management of some resources at the seashore

**Table 1.4 Assateague Island National Seashore – Special Seashore Designations**

| Designation | Finding |
|---|---|
| **Wilderness** | Approximately 5,200 acres on Assateague Island in Maryland retain characteristics potentially qualifying for wilderness designation, of which 440 acres have been formally recommended to Congress for wilderness designation and 4,760 acres compose a "potential wilderness addition" that is eligible for wilderness designation. The NPS manages these lands to protect and improve wilderness character (section 1.7). |
| **National Estuary (US EPA)** | The National Estuary Program was established under section 320 of the 1987 Clean Water Act Amendments as a U.S. EPA place-based program to protect and restore the water quality and ecological integrity of estuaries of national significance. Portions of Assateague Island National Seashore are located within the Maryland Coastal Bays National Estuary, one of 28 national estuaries along the coasts of the Atlantic Ocean, Gulf of Mexico, Pacific Ocean, and Puerto Rico. The NPS is an active partner in the management conference for the Maryland Coastal Bays, coordinated through the Maryland Coastal Bays Program (section 1.9.5). |
| **Marine Protected Area** | The Marine Protection, Research, and Sanctuaries Act of 1972 provides for designation of a national system of marine protected areas (MPAs). The purpose of the system is to support the coordinated effective stewardship, conservation, restoration, sustainable use, and public understanding and appreciation of the nation's significant natural and cultural marine heritage and sustainable production marine resources, with due consideration of the interests of and implications for all who use, benefit from, and care about the marine environment. Assateague Island National Seashore is a designated MPA. Benefits of designation include better protection through regional coordination, public awareness, and recognition as an important conservation area; enhanced stature locally, nationally, and internationally; more effective and efficient outreach to the public; and enhanced protections that call for federal agencies to avoid harm to the natural and cultural resources within all MPAs. |
| **Western Hemisphere Shorebird Reserve** | The Western Hemisphere Shorebird Reserve Network (WHSRN) seeks to conserve shorebird species and their habitats through conservation of crucial sites used by shorebirds during their breeding, migratory, and winter season. The WHSRN has designated the Maryland-Virginia Barrier Islands, including Assateague Island, an internationally significant shorebird reserve site. It is internationally significant because of extremely high species diversity during both spring and fall migrations and extremely high maximum bird counts (WHSRN 2012). The Virginia Coast Reserve Program of The Nature Conservancy helps to coordinate the actions of WHSRN's partners and stakeholders at Assateague Island. |
| **National Audubon Society Important Bird Area** | The Important Bird Areas Program (IBA) is a global effort of the National Audubon Society to identify and conserve areas that are vital to birds and other biodiversity. Within the network of IBAs, Assateague Island is designated an IBA of global and continental importance. It is globally significant due to the 60+ pairs of piping plovers (*Charadrius melodus*) that nest on its beaches, representing 2 percent of the species global population (National Audubon Society 2012). National Audubon seeks to ensure that important bird areas are properly managed and conserved by working with local Audubon chapters, landowners, public agencies, community groups, and other non-profits. |
| **Essential Fish Habitat** | The 1996 Magnuson-Stevens Act required agencies and others to cooperate to protect, conserve, and enhance essential habitats for federally-managed marine and anadromous fish species. Essential fish habitats are those water and substrate areas needed for fish to spawn, breed, feed, and grow to maturity. Species for which essential fish habitat exists either offshore of the seashore or in Chincoteague Bay include red hake, winter flounder, window pane flounder, bluefish, king and Spanish mackerel, cobia, summer flounder, scup, black sea bass, spiny dogfish, and several species of sharks that migrate through the area (such as sand tiger shark, blue shark, sandbar shark, and scalloped hammerhead shark) (NOAA 2012a). Adults of most of these species also use marine or brackish waters in essential fish habitat either in Chincoteague Bay or the Atlantic coast and several require estuaries or other specific habitat for laying eggs, larvae, and juveniles. |

## 1.5 Planning Issues

Throughout development of the Draft GMP/EIS the planning team used a variety of scoping techniques to identify the issues related to management of the seashore, the range of management alternatives that should be considered in the Draft GMP/EIS to address those issues, and the range and nature of impacts that should be used to evaluate and compare alternative management actions. Scoping occurred internally with the NPS staff and externally with other public agencies, partner organizations, and the general public.

The following issues provided the basis to frame key questions to be considered during the course of the planning process.

### 1.5.1 NATURAL COASTAL PROCESSES AND EFFECTS OF CLIMATE CHANGE

Natural coastal processes including the action of tides, wind, waves, currents, and sea level rise continually influence and shape Assateague Island. In response to sea level rise, the island is slowly moving westward through storm overwash and inlet formation processes. Most island changes occur during intense storm events which – while lasting only a few days – can dramatically alter the physical characteristics of the island and bay. As global climate change intensifies, the rate of sea level rise and the intensity of coastal storms will likely increase and accelerate the rate and magnitude of island changes. (See section 2.2 for more information regarding the implications for planning related to climate change/sea level rise at the seashore.) The GMP/EIS addresses the following questions related to natural coastal processes and the effects of climate change/sea level rise.

- ***How will NPS respond to global climate change/sea level rise impacts on the seashore?***

The natural environment of the seashore is expected to become less stable under most global climate change/sea level rise projections. Driven by higher rates of sea level rise, more intense and possibly more frequent storms, rising temperatures, changes in precipitation patterns and drought, the island will likely experience significant changes in its physical form, the type and condition of habitats, and the diversity of species. While the pace and magnitude of climate change remains uncertain, it is clear that the consequences of even low-end projections will compound existing threats to seashore resources and challenge the NPS's ability to fulfill the seashore's mission.

- ***To what extent will NPS continue to provide permanent visitor facilities on the island given the dynamic nature of the island and the continuous need for public investment to maintain those facilities?***

Because Assateague Island is an exceptionally dynamic landform, all infrastructure and developed visitor facilities are ultimately at risk of damage or loss. At present, the management response to this challenge varies, ranging from rebuilding facilities after

storm damage – as is the general policy in the seashore's Maryland District – to minimization of permanent structures combined with use of temporary/seasonal structures that are removed from the island before major storms – as is the policy in the seashore's Virginia District. In light of the high potential for accelerating rates of sea level rise due to global climate change, maintaining these facilities over time will require repeated and likely more frequent public investment for repairs and reconstruction, and may not be sustainable.

- ***What should the NPS do if major storms create breaches in the island that limit access?***

Most global climate change scenarios indicate that barrier islands such as Assateague Island will become much more dynamic as a result of accelerating rates of sea level rise, and more intense and possibly more frequent storms. The formation of breaches and new inlets during storm events has occurred repeatedly on Assateague, and is very likely to occur again. Depending upon the location, future breaches or new inlets may render portions of the island's backcountry largely inaccessible by traditional means and may also have an effect on nonfederal lands and coastal communities.

### 1.5.2 VISITOR USE AND VISITOR EXPERIENCE

The seashore is one of the few publicly accessible coastal environments in the densely populated northeast United States where visitors can experience unspoiled beaches, tranquil bays and marshlands, natural sounds, quiet, dark night skies, and solitude. Most visitors to the island seek an easily accessible beach experience where they can be near the ocean, sit in the sun, swim, fish, beachcomb, and play. Most visitors want to see the wild horses. A majority of visitors typically do not seek out the many other opportunities for natural resource appreciation offered at the seashore, although some hunt and shellfish or paddle the back bays. The GMP/EIS addresses the following questions related to visitor use and visitor experience.

- ***What safe and sustainable alternative strategies should be used to enhance visitor access to the island?***

**Alternative Transportation Strategies for Access from MD 611**. Existing roads and parking facilities do not meet current visitor demand and cannot be expanded without significant resource damage and loss. During the busy summer season, visitors who arrive by automobile sometimes experience delays entering the seashore and reaching their desired destination. The NPS has completed an alternative transportation study to explore options for addressing the transportation problems. Potential options are likely to include improved traffic information systems to alert visitors of congestion before they enter the seashore, the use of mass transit from satellite parking facilities on the mainland, and relocation of the entrance stations for the seashore and Assateague State Park to a joint facility on the mainland. A joint entrance station could not be operated without changes to the state legislation which authorized the bridge and which prohibits

tolls. In the absence of a legislative change, the NPS would have to assume ownership of the bridge and its associated maintenance in order to collect entrance fees on the mainland. In all cases, the development of alternative solutions to transportation problems in the Maryland District will require collaborative planning with Maryland DNR for Assateague State Park.

- ***What outdoor recreation opportunities should be available to visitors as natural coastal processes and the effects of climate change and sea level rise reshape Assateague Island and alter access to seashore facilities?***

**Location and Types of Visitor Facilities**. As natural coastal processes and/or the effects of climate change/sea level rise reshape Assateague Island, the maintenance of the current circulation system and the location of protected beaches, campgrounds, and other facilities on the island are likely to change. In concert with questions of visitor facilities and visitor access described above, consideration must be given to how to support the desired range of outdoor recreational opportunities.

**Oversand Vehicle Use (OSV).** Access to a more remote beach experience via four-wheel drive vehicle in the OSV use area is one of the seashore's popular visitor activities. During summer, the demand for access to the seashore's designated OSV use area frequently exceeds the 145 vehicle capacity, forcing visitors to wait in line for long periods before space becomes available. Once getting into the OSV use area, most

visitors stay within the first few miles of beach, leaving much of the remaining route available for the enjoyment of a relatively small number of visitors. Changes to the island as a result of sea level rise could change the location and extent of this experience.

### 1.5.3 PARTNERSHIPS

Three government agencies manage Assateague Island: MD DNR, FWS, and the NPS. The seashore relies on the actions of surrounding communities to address regional traffic and congestion, protect water quality, and augment emergency services. Additional opportunities exist for partnerships that would help the NPS better protect resources, enhance the visitor experience, increase operational efficiencies, expand youth outreach programs, and reach additional underserved audiences. The GMP addresses the following question related to partnerships.

- ***How should the NPS work cooperatively with its neighbors and public agencies at all levels of government to protect Assateague Island's resources from the adverse effects of land uses and activities both outside and within the seashore's boundaries?***

The seashore's neighbors and public agencies at all level of governments routinely engage in activities that directly and indirectly impact Assateague Island's resources and the experiences that visitors have in the seashore. Likewise, the actions that NPS undertakes at Assateague Island National Seashore can have an impact on other agencies and nearby communities.

**Ocean and Bay Stewardship**. Through its enabling legislation, the NPS was granted jurisdiction and certain authorities over the waters within the seashore boundary. The submerged lands within the seashore are, however, owned by the states of Maryland and Virginia. As a result, multiple state and federal agencies have diverse responsibilities in managing various aspects of the seashore's marine resources. The complex nature of ocean and bay stewardship issues (e.g. authority over waterfowl hunting blinds, incompatible recreational activities, commercial fin fishing and aquaculture, potential offshore wind energy development) requires a cooperative approach to defining and resolving both existing and future threats to the seashore's marine resources.

**Water Quality**. The seashore includes marine and estuarine waters that are a part of larger systems influenced by land uses and activities in the mainland watershed. Seashore staff has been monitoring water quality in Chincoteague, Sinepuxent, and Newport Bays for more than 20 years, and has documented a significant decline in water quality over the last decade that threatens the health and sustainability of the estuary. The NPS has minimal regulatory authority outside the seashore boundary – the principal source of pollutants entering the estuary. Without comprehensive action to reduce pollutant loads (primarily nitrogen and phosphorus) from the mainland

watershed it is unlikely that the NPS will be successful in protecting the seashore's aquatic resources from becoming impaired.

**Marine Resources**. Bay habitats such as seagrass beds and salt marshes support highly diverse plant and animal communities, including recreationally important finfish, shellfish, shorebirds, and other species. The ocean area within the seashore boundary connects many of these same species to the bays and supports ocean dwelling animals including marine mammals. The seashore's purpose in enabling legislation emphasizes outdoor recreational uses. The seashore's aquatic habitats are subject to consumptive activities such as aquaculture. Aquatic resources face significant threats from declining water quality caused by excess nutrient loading. NPS must manage recreational uses to conserve resources that boaters, anglers, beachgoers, campers, and wildlife enthusiasts enjoy.

Commercial extraction of marine resources has a long history in the region. The seashore's recent ethnographic overview and assessment (Chambers et al 2012) notes that "The traditions of 'watermen' and their communities provide the thread for associations that run through the generations." Commercial aquaculture began in the 1850s. The commonwealth of Virginia has leased land for clam and oyster aquaculture within what became seashore waters since the 1890s. Toms Cove in the Virginia part of the seashore is the site of most aquaculture. Aquaculture alone is a $20M industry around Chincoteague, with some considerable portion of that coming from seashore waters. There is no aquaculture in Maryland waters, and aquaculture within the seashore is prohibited by the state of Maryland's regulations.

The seashore's authorizing legislation gives management of shellfishing to the states; this has been interpreted as giving the management of fishing for wild shellfish to Maryland and Virginia. Aquaculture is considered agriculture and therefore is prohibited in parks unless specifically authorized or needed to portray the historic scene (36 CFR 2.60). Horseshoe crabs are arachnids (arthropods), not crustaceans; therefore, they are wildlife and their harvest is prohibited in national parks. (36 CFR 2.2). The seashore, now 50 years old, has never enforced these provisions, some of which came into being after the designation of the seashore.

The leasing of submerged bottomland within the seashore boundary is commonplace in Virginia. Although Virginia halted new leasing of bottomlands and has designated much of the submerged land in Toms Cove as public oyster grounds (thereby protecting recreational opportunities), other areas within the seashore boundary in Virginia remain available for commercial leasing. In Maryland, the state has recently prohibited commercial aquaculture within the seashore's waters.

### 1.5.4 WILDERNESS

The *Assateague Island Wilderness Study* (NPS and FWS 1974) and subsequent study revisions determined that 5,200 acres qualified for federal wilderness designation pursuant to the Wilderness Act. Based upon findings from these studies, President Gerald Ford recommended to Congress that 440 acres be immediately designated as wilderness and that the remaining 4,760 acres be classified as "potential wilderness" to become eligible when non-conforming backcountry development and uses were eliminated. The bill recommending creation of the Assateague wilderness was introduced in Congress but no action was taken.

The seashore's 1982 GMP recommended that wilderness designation be reconsidered when the physical remnants of former development were removed. As part of the seashore's current planning process, the NPS is required to make a determination concerning how these areas will be managed to protect and enhance wilderness character. The GMP/EIS addresses the following question related to wilderness.

- ***How should the Assateague backcountry be managed to protect wilderness character while allowing for compatible recreation and NPS operational needs?***

### 1.5.5 CULTURAL RESOURCES

The seashore contains a variety of locally, regionally, and nationally significant cultural resources. These resources, as well as their associated documents and objects, are all that remain from the relatively brief periods when humans have occupied Assateague Island. They provide important links to both the history and purpose of the seashore. Two resources – the former Assateague Beach U.S. Coast Guard Station and the former Green Run Lodge – are eligible for listing the *National Register of Historic Places*. There are significant gaps in the seashore's understanding of and ability to protect and interpret these resources. The Assateague Beach U.S. Coast Guard Station sits vacant and underutilized due to problems with access. Other issues include a backlog of archival materials needing assessment, cataloging, and conservation, and the absence of archeological survey data for most of the island. The GMP/EIS addresses the following question related to cultural resource management.

- ***How should the seashore's cultural resources be managed?***

## 1.6 Impact Topics

Impact topics are the seashore resources and values that could be affected, either beneficially or adversely, by implementing any of the alternatives under consideration. This section identifies the impact topics that the planning team chose to retain for detailed analysis. It also provides a brief discussion of the impact topics that the planning team initially considered but then dismissed from further analysis.

### 1.6.1 IMPACT TOPICS RETAINED FOR FURTHER ANALYSIS

Table 1.5 lists the impact topics retained for further analysis. Consideration of federal laws, regulations, Executive Orders, *NPS Management Policies* (NPS 2006c), NPS staff knowledge of the seashore and the issues and concerns expressed by the public and other agencies during the GMP/EIS scoping process (appendices C and D) provided the basis for identifying the topics to be retained. Chapter 3 – Affected Environment contains a thorough description of the resources and values related to each topic retained for analysis. Chapter 4 – Environmental Consequences – provides for each topic an analysis of the impacts associated with the four alternatives under consideration.

**Table 1.5. Impact Topics Retained for Further Analysis**

| | Impact Topics |
|---|---|
| **Impact Topics RETAINED for Further Analysis in the GMP/EIS** | • water resources<br>• habitats<br>• wildlife<br>• federally listed threatened or endangered species<br>• historic structures<br>• cultural landscapes<br>• seashore operations<br>• access and circulation<br>• visitor use and visitor experience<br>• socio-economic environment |
| **Impact Topics DISMISSED from Further Analysis in the GMP/EIS** | • air quality<br>• lightscape and night skies<br>• acoustic environment and soundscape<br>• archeological resources<br>• ethnographic resources<br>• museum collections<br>• Indian Sacred Sites<br>• Indian Trust Resources<br>• wild and scenic rivers<br>• environmental justice<br>• energy requirements and conservation potential<br>• natural and depletable resources |

### 1.6.2 IMPACT TOPICS CONSIDERED AND DISMISSED FROM FURTHER ANALYSIS

- **Air Quality**

**Background**. The 1963 Clean Air Act, as amended (42 USC 74-1 et seq.) requires federal land managers to protect seashore air quality. *NPS Management Policies* (NPS 2006c) address the need to analyze air quality during seashore planning.

Assateague Island National Seashore is designated a Class II air quality area by provisions of the 1977 Clean Air Amendments, meaning that the state may permit a moderate amount of new air pollution as long as neither ambient air quality standards nor the maximum allowable increases over established baseline concentrations are exceeded. Because the seashore is within a Class II Clean Air Area, NPS is not required to conduct air quality or visibility monitoring within the seashore.

**Reasons for Dismissal.** All the alternatives considered in this Draft GMP/EIS would have local short-term adverse impacts on air quality caused by fugitive dust. In particular, operation of equipment, vehicles, and other construction activities, such as building, demolition, or rehabilitation, could result in temporary increases in vehicle exhaust and emissions. However, hydrocarbons, nitrates, and sulfur dioxide emissions, as well as any airborne particulates created by fugitive dust plumes would be rapidly dissipated. These impacts would be mitigated through requirements for contractors and NPS maintenance personnel to apply water and dust control agents at construction sites. All the alternatives would also have local long-term negligible adverse impacts on air quality caused by increased local traffic and vehicle idling during peak visitation periods. The seashore would continue its involvement in the NPS Green Parks initiative and would work to reduce or eliminate impacts on air quality resulting from seashore operations. Overall, there would be negligible impacts on local air quality which would not change existing conditions in a meaningful way. Because all of the foreseeable impacts would be negligible, the air quality impact topic has been dismissed from further analysis.

- **Lightscape and Night Skies**

**Background.** *NPS Management Policies* (NPS 2006c) require the NPS to preserve to the greatest extent possible, the natural darkness and other components of the natural lightscape. The natural lightscape is composed of the natural resources and values that exist in the absence of human-caused light.

The two main sources of light pollution at the seashore are the towns of Ocean City and Berlin. During most nights, astronomical features including the Milky Way and Beehive Clusters are readily observed. Natural vegetation on the west side of the island assists in maintaining darkness in the ocean beach habitats (NPS 2011d). In general night sky

brightness at the seashore is at risk of increasing as human population increases in the region (NPS 2011d).

**Reasons for Dismissal.** All the alternatives considered in this Draft GMP/EIS would have long-term negligible impacts on the seashore's lightscape and night skies. Future management of the seashore would comply with NPS management polices to protect natural darkness and other components of the natural lightscape. The NPS would restrict the use of artificial lighting to those areas where security, basic human safety, and specific cultural resource requirements must be met. Minimal impact lighting techniques would be used including shielded light fixtures to prevent light spill over and use of low-intensity lights. Artificial light, when used, would be shielded to prevent the disruption of the night sky, physiological processes of living organisms, and other natural processes. The NPS would also seek cooperation of seashore visitors, neighbors, and local government agencies to prevent or minimize the intrusion of artificial light into the night scene of the seashore's ecosystem. Collectively these actions would result in a local long-term beneficial impact on the lightscape and night skies. As a result, the lightscape and night skies impact topic was dismissed from further analysis.

- **Acoustic Environment and Soundscape**

**Background.** *Director's Order 47: Preservation of the Acoustic Environment and Noise Management in the National Park System* and *NPS Management Policies* (NPS 2006c) require the NPS to preserve, to the greatest extent possible, the soundscapes and natural acoustic conditions of parks and to minimize noise. The acoustic environment encompasses all the natural and cultural sounds that occur in the seashore as modified by the environment. It includes the physical capacity for transmitting those intrinsic sounds and the interrelationships among seashore natural sounds of different frequencies and volumes. Soundscape is the component of the acoustic environment that can be perceived and comprehended by humans. The character and quality of the soundscape influence human perceptions of an area, providing a sense of place that differentiates it from other regions. The NPS is also required to restore to the natural condition wherever possible those seashore acoustic resources that have become degraded by noise, and to protect natural landscapes from impacts.

In general natural ambient sound levels at the seashore are low in most areas of the seashore, except where high levels of natural sounds emanate from the surf along the ocean beach. Human-made sounds originating in the seashore emanate from seashore operations, visitor activities, traffic on seashore roads, OSV use, and powerboats. Other seashore users contributing to the soundscape include beach users, hikers, surfers, and paddlers.

**Reasons for Dismissal.** All the GMP alternatives considered in this Draft GMP/EIS would have a short-term negligible adverse impact on the seashore's natural soundscape. Construction activities associated with planned new or modified facilities or

transportation projects would generate temporary unwanted construction-related sound that would be direct and short-term in nature and concentrated in areas near construction sites. In accordance with normal NPS construction practice, noise-generating construction equipment would be equipped with effective noise control devices. All equipment would be properly maintained to ensure that no additional unwanted sound would be generated. The seashore would further prevent and/or minimize unwanted construction sound by managing its intensity, frequency, magnitude, and duration in any one place on any particular day. Noise would also be minimized by ensuring that timing of work in the day or in the year would reduce impacts to noise sensitive resources such as visitor areas, nesting areas, or habitat for sensitive species.

Alternatives 2, 3, and 4 would likely involve eventual relocation of some seashore facilities. When this occurs, seashore managers would select locations that would continue minimal impacts to acoustic resources. When decisions are made regarding the use of OSVs, the NPS would seek to minimize noise impacts by considering noise sensitive resources.

Implementation of an alternative transportation system (ATS) in alternatives 2, 3, and 4 would have a long-term beneficial impact on the seashore's natural soundscape. The ATS would reduce the number of vehicles on the island and in turn reduce the associated vehicle-generated noise. If access is lost to some or all of the island, visitation and OSV use and associated noise would likely diminish in all of the alternatives.

For the reasons outlined above, the soundscape impact topic was dismissed from further analysis.

- **Archeological Resources**

**Background.** The terrestrial archeological sites found within the seashore are primarily related to historic operations of the U.S. Lifesaving Service and several small residential and commercial developments that date from the late nineteenth and mid-twentieth centuries. The seven known sites include North Beach, Pope Island, and Green Run Lifesaving Stations, the Birch Saltworks, Green Run Village , the Green Run Cemetery, and Scott's Ocean House Hotel. All of these sites have been determined ineligible for the *National Register of Historic Places*. At each site the original above-ground features associated with the site have been lost through physical removal, fire, vandalism and theft, or natural deterioration.

The remains of shipwrecks are also known within the seashore boundary. Of particular note are the La Galga, an 18$^{th}$ century Spanish frigate that wrecked near the Maryland/Virginia state line, and the Despatch, the United States' first presidential yacht. Additional sites have been identified in the shallow waters adjacent to the island

in both the ocean and bay, as well as within the body of the island itself. Major storms periodically uncover the remains of ships, and provide a brief glimpse into past tragedies.

The presence or absence of prehistoric archeological sites has not been systematically investigated on the majority of Assateague Island. The potential for undiscovered prehistoric sites is generally considered minimal, primarily owing to the changing nature of the island's position relative to the ocean and the mainland. Occasional discoveries of aboriginal projectile points in the ocean surf zone constitute the only physical evidence of Native American use of the island. There are no shell piles on the island. If Native Americans used the island, it is likely that their use was seasonal for hunting and harvesting.

**Reasons for Dismissal.** NPS will implement standard mitigation measures in accordance with the *NPS Management Policies* (NPS 2006c), the *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation*, and the *NPS Cultural Management Guideline (NPS-28)* (NPS 2002c) for any ground-disturbing actions associated with implementation of the preferred alternative in the approved GMP/EIS. These actions will seek to ensure that potential adverse impacts to archeological resources are avoided or minimized.

Completion of an island wide archeological overview and assessment is included as part of alternative 1 – continuation of current management and is also common to the three action alternatives (alternatives 2, 3, and 4). This action would result in a beneficial impact on archeological resources by informing seashore managers regarding where previously unknown resources may be present on the island and by providing general guidance as to management actions needed to protect those resources from adverse impacts due to ground disturbance associated with seashore operations, development of seashore facilities, and visitor use.

For the reasons outlined above, the archeological resource impact topic was dismissed from further analysis.

- **Ethnographic Resources**

**Background.** Ethnographic resources are 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 Director's Order 28). Under NPS definitions, traditionally associated people are those who meet three criteria: (1) their associations with seashore resources predate the establishment of the seashore, (2) such associations usually span at least two generations (or forty years), and (3) their associations with seashore resources are important to their cultural identity (NPS 2002c). The determination as to whether a resource is an ethnographic resource "depends on

whether associated peoples perceive the resources as meaningful to their identity as a group and the survival of their lifeways (NPS 2002c).

A recently completed ethnographic overview and assessment for the seashore compiled ethnographic information about historical and contemporary peoples living on and near the seashore, documented traditional activities engaged in by those peoples, and provided direction for future ethnographic research (Chambers and Sullivan 2012). Traditional uses of the seashore include hunting, fishing, and gathering of resources by residents of nearby communities for subsistence, commercial, and recreational purposes on Assateague Island and within its adjacent marsh islands and nearby water areas. These uses reflect annual rounds of economic, social, and cultural activities that have occurred in relation to the bay – including hunting, fishing, gathering of naturally-occurring resources, intermittent or regular wage employment, crafts production, recreational activities, and recurring community events, celebrations, religious meetings, and other group activities. Continued access to the seashore's resources is important in relation to the continuity and preservation of lifeways in the seashore's nearby communities and in terms of the contribution of such resources to local or family socioeconomic systems.

**Reasons for Dismissal.** In all of the alternatives considered in this Draft GMP/EIS, opportunities for hunting, fishing, recreational uses, and recurring community events and group activities would continue to be available for local residents, except for horseshoe crab harvest, which would be wound down over a reasonable length of time. Aquaculture leases would continue to be permitted via a special use permit under (36 CFR 2.60) to maintain the historic setting. The seashore's resources would be managed to support existing uses at the seashore. The seashore's public hunting program would continue to be managed for its recreational values and as a resource management tool to control non-native species, although if land-based access to the backcountry is altered due to natural coastal processes or the effects of climate change/sea level rise, hunting access to some portions of the seashore could become more difficult. Recreational fishing and crab harvesting would continue. Access to former retained rights and to the Green Run Cemetery (for family relatives only) would be maintained. Collectively these actions would have no impact on the ethnographic resources of significance to residents of the seashore's nearby communities. For the reasons outlined above, the ethnographic resources impact topic was dismissed from further analysis.

- **Museum Collections**

**Background.** *NPS Management Policies* (NPS 2006c) require the NPS to collect, protect, preserve, provide access to, and use objects, specimens, and archival and manuscript museum collections in the disciplines of archeology, ethnography, history, biology, geology, and paleontology to aid understanding among seashore visitors, and to advance knowledge in the humanities and sciences.

The majority of the seashore's museum collection consists of natural history voucher specimens or other objects relating to the seashore's natural resources. Significant numbers of archaeological and archival materials are also included within the total collection of 4,951 items. The largest component of the natural history collection is an herbarium, containing specimens of 217 plant species. Thirty-nine objects in the museum collection are of a historical nature, composed primarily of materials relating to local U.S. Lifesaving Service and Coast Guard operations. A small number of objects relate to past residential and commercial development on the island. Twenty-nine prehistoric archaeological artifacts, aboriginal projectile points, and other implements are maintained in the collection. The balance of the collection is composed of general biological specimens and a few paleontological specimens, representing a variety of fossils of marine origin found on island beaches.

In addition to the 4,951 items in the collection, the seashore has a large backlog of archival materials in need of assessment to determine if they meet the NPS definition of archives; upon future assessment, materials considered archives will be catalogued and added to the seashore's collection. The seashore's storage facilities at seashore headquarters and at the Maryland visitor center are adequate for storage needs.

**Reasons for Dismissal.** The alternatives considered in this Draft GMP/EIS would have no adverse impacts on museum collections. Beneficial impacts to museum collections would result from actions in the alternatives related to rehabilitation or reconstruction of the existing seashore headquarters complex by providing rehabilitated or new space for collections storage in compliance with *NPS Management Policies* (NPS 2006c), *NPS Director's Order #24: NPS Museum Collections Management* (NPS 2008), *NPS Cultural Management Guideline (NPS-28)* (NPS 2002c), and the *NPS Museum Handbook* (NPS 2000c).

The seashore is seeking funding to complete a collections management plan which will provide recommendations related to collection documentation, archives and manuscript collections, archeological collections, collections storage, museum environment, security and fire protection, staffing, and programming and funding sources. Implementation of the plan recommendations would be included as part of alternative 1 – continuation of current management, would be common to the three action alternatives (alternatives 2, 3, and 4), and would result in a local long-term beneficial impact on museum collections.

For the reasons outlined above, the museum collections impact topic was dismissed from further analysis.

- **Indian Sacred Sites**

**Background.** Executive Order 13007, "Indian Sacred Sites" requires managers of federal lands to avoid adversely affecting the physical integrity of Indian sacred sites.

**Reasons for Dismissal.** There are no sacred sites identified by an Indian tribe subject to protections of Executive Order 13007 within the seashore boundaries. Therefore, the Indian sacred sites impact topic was dismissed from further analysis.

- **Indian Trust Resources**

**Background.** Secretarial Order 3175 requires that any anticipated impacts to Indian Trust Resources from a proposed project or action be explicitly addressed in environmental documents.

**Reasons for Dismissal.** There are no Indian Trust resources within the seashore boundaries. None of the land within the seashore is held in trust by the Secretary of the Interior for the benefit of Indians due to their status as Indians. Therefore the Indian Trust Resources impact topic was dismissed from further analysis.

- **Environmental Justice**

**Background.** E.O. 12891, "General Actions to Address Environmental Justice in Minority Populations and Low Income Populations," requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse health or environmental impacts of their programs and policies on minorities or low-income populations or communities.

Minority and low-income populations as defined in E.O. 12891 reside in the vicinity of the seashore in both Worcester County and Accomack County. In Worcester County, four percent of families and ten percent of individuals live below the poverty level and minorities compose eight percent of the total population (U.S. Census Bureau 2011b). In Accomack County, six percent of families and 16 percent of individuals live below the poverty level and minorities composed 42 percent of the total population (U.S. Census Bureau 2011b).

**Reasons for Dismissal.** Scoping activities conducted for the Draft GMP/EIS sought to involve all residents of Worcester and Accomack Counties (section 5.1). During the scoping process no issues or concerns specific to minority/low income populations were identified. No management actions under any of the alternatives evaluated in the Draft GMP/EIS are directed at minority/low income populations nor are any of the potential effects of the alternatives believed to have disproportionate effects on minority/low income populations. For these reasons the environmental justice impact topic was dismissed from further analysis.

- **Energy Requirements and Conservation Potential**

**Background.** *NPS Management Policies* (NPS 2006c) require the NPS to conduct its activities in ways that use energy wisely and economically.

**Reasons for Dismissal.** Management actions in all alternatives considered in this Draft GMP/EIS would comply with NPS sustainable energy design and energy management requirements. Any facility development, whether it is a new building, a renovation, or an adaptive reuse of an existing facility, would include improvements in energy efficiency and reduction in greenhouse gas emissions for both the building envelope and the mechanical systems that support the facility. Maximum energy efficiency would be achieved. Energy-efficient construction projects would be used as an educational opportunity for the visiting public. All projects that include visitor services facilities would incorporate Leadership in Energy and Environmental Design (LEED) standards to achieve a silver rating.

In all alternatives, the facilities, vehicles, and equipment would be operated and managed to minimize consumption of energy, water, and nonrenewable fuels. Full consideration would be given to the use of alternative fuels. Alternative transportation programs and the use of bio-based fuels would be encouraged, where appropriate. Renewable sources of energy and new developments in energy-efficiency technology, including products from recycling of materials and waste, would be used where appropriate and cost-effective over the life cycle. However, energy efficiencies would not be pursued if they would cause adverse impacts on seashore resources and values.

For these reasons, the energy requirements and conservation potential impact topic was dismissed from further analysis.

## 1.7 The Seashore's Wilderness

In 1974 the NPS and the FWS jointly evaluated the suitability of portions of Assateague Island for wilderness designation (NPS and FWS 1974). The study concluded that portions of the island retained "primeval character and influence" and that about 6,500 acres of land qualified for wilderness designation, including 5,200 acres managed by the NPS and 1,300 managed by the FWS. In 1974 President Gerald Ford recommended to Congress that 440 acres of the 5,200 acres managed by the NPS be formally designated wilderness. The balance of the NPS managed lands – 4,760 acres – were identified as potential wilderness, to become eligible for wilderness designation when non-conforming features and uses were eliminated. Congress failed to act on the president's recommendation. The seashore's subsequent 1982 *General Management Plan* (NPS 1982b) concluded that wilderness designation should be reconsidered once the island's natural zone (encompassing the potential wilderness areas) is free of non-conforming features present due to the retained rights of use and occupancy by 11 former property owners.

The last of the retained rights of use and occupancy within the island's natural zone expired in 2002. As a result, during the new GMP planning process the planning team

has reviewed the status of the Assateague Island Wilderness in Maryland and has found that:

- While management actions by the NPS since 1974 have improved conditions and reduced impacts to wilderness character, approximately 2,074 acres or 51 percent of the lands within the wilderness are affected by unnatural conditions or incompatible uses and do not currently meet desired wilderness conditions. Among these conditions and incompatible uses are the present OSV corridor located in designated areas along the ocean beach and areas that continue to be used for administrative/operational access to support essential functions associated with maintaining backcountry campgrounds, recreational hunting, and other resource management projects.
- Additional lands within the seashore boundary that would likely meet the criteria for wilderness designation do not appear to have been considered in the original *Assateague Wilderness Study* (NPS and FWS 1974). These lands should be studied to evaluate their suitability as new potential wilderness.

As ongoing and future actions by the NPS are completed, the acreage of wilderness lands meeting the desired conditions should increase substantially. Recommended management actions to be implemented through the GMP to further protect and enhance wilderness qualities would generally include the following:

- Undertake an assessment of wilderness eligibility and prepare a new wilderness study that addresses the following:
  - review the wilderness boundary in the context of new assessment of acreage, climate change, sea level rise and erosion, as well as specific shoreline management activities (e.g., breach management)
  - amend the existing wilderness boundary to address what are presently non-conforming uses such as the OSV corridor and access areas that are required for administrative use ("cherry stems")
  - consider new access corridors that may be necessary to accommodate new, water-based public access
- Generally manage recommended and potential wilderness to preserve, restore, and enhance natural ecological conditions and wilderness qualities while providing limited opportunities for low density, low impact primitive recreational experiences.
- Implement a long-term monitoring program to assess the conditions and trend of wilderness character over time based on the "keeping it wild" framework, adapted for the individual characteristics of the Assateague Island Wilderness.

## 1.8 The Seashore's Boundary

As part of the planning process, the NPS is required to review the seashore boundary and – if appropriate – make recommendations for potential boundary adjustments. Boundary adjustments may be made for the following purposes:

- to protect significant resources and values
- to enhance opportunities for public enjoyment related to the seashore purposes
- to protect seashore resources critical to fulfilling the seashore's purposes
- to address operational and management issues

The NPS planning team has reviewed the existing seashore boundary to identify the need for a boundary adjustment for these purposes and to consider all alternatives in lieu of a boundary adjustment that would protect the seashore's resources and/or address the following management issues.

- **Dynamic Nature of the Seashore's External Water Boundary**

  According to legal doctrine the seashore's water boundary moves with changes in island location as a result of natural coastal processes. As a result, changes that have occurred in the physical location and configuration of Assateague Island since the seashore's authorization have now caused the seashore's water boundary to include inappropriate areas. A GIS analysis of the island's dynamics has indicated that the boundary now extends completely across Sinepuxent Bay and includes portions of the federal navigation channel. In Virginia, island changes have also resulted in the boundary shifting west and incorporating portions of the Chincoteague Inlet channel. It is unlikely that the boundary of the seashore was ever intended to include these federal navigation channels, due to the inherent incompatibility of activities occurring within those areas.

  In the future, the NPS would continue to assess options to resolve boundary issues associated with the changing location of the island's shoreline.

- **Federal Land Management Responsibilities**

  In order to clarify federal land management responsibilities on Assateague Island, the NPS proposes to assume full management responsibility for those lands in Maryland originally purchased with FWS-appropriated funds (approximately 418 acres). Conversely, the FWS proposes to assume full management responsibility for those lands in Virginia originally purchased with NSP-appropriated funds (approximately 400 acres). This would not affect management of the Assateague Beach U.S. Coast Guard Station, for which the NPS would retain ownership and management responsibility.

- **Land Requirements on the Mainland (for Seashore Administrative Purposes)**

The seashore's enabling legislation addresses land acquisition on the mainland in Worcester County, Maryland, for administrative purposes. The most recent amendment (PL 102-320) authorizes the Secretary of the Interior to include within the seashore boundary up to 112 acres of land or interests therein on the mainland in Worcester County, Maryland (appendix A). Currently, NPS has ownership or easement interests in approximately 105.41 acres on the mainland. Most of the land owned by NPS is occupied by the seashore's administrative offices, maintenance facility, Maryland visitor center, environmental education building, and housing for NPS staff.

The GMP alternatives include various proposals for new land acquisition on the mainland which would exceed the 112-acre limit. As a result the NPS would seek an increase in the seashore's authorized ceiling for acquiring interests in land (fee simple and easements) on the mainland in Worcester County, Maryland. The need for the ceiling increase and the amount of the ceiling increase would vary from alternative to alternative (sections 2.3.8, 2.4.9, 2.5.8, 2.6.8, and 2.7.8).

## 1.9 Related Plans

Various public agencies and governmental bodies have recently completed plans or have projects underway that directly and/or indirectly relate to Assateague Island National Seashore. The NPS has also completed plans for a number of subareas within the seashore and for management of seashore resources.

### 1.9.1 NATIONAL PARK SERVICE PLANS

- **Assateague Island National Seashore General Management Plan**

The *Assateague Island National Seashore General Management Plan* (NPS 1982b) established the broad framework for management protection and use of lands within the seashore, including those managed by the NPS within Chincoteague National Wildlife Refuge, since 1982. The GMP provided a comprehensive strategy to guide management of the seashore and described the general actions to be taken related to management zoning, resource, management, visitor use, development of seashore facilities, and land protection. Approximately 91 percent of the island was assigned to a natural zone, including both a primitive zone and a traditional recreation subzone (legally open to OSVs). A development zone – encompassing most of the remainder of the island – was recommended to contain all general seashore improvements. Within the developed zone there were two subzones, including a general recreation/development subzone (the North Beach Developed Area) and an administrative subzone (the Headquarters/Visitor Center Area). The island's ten cultural resource sites or structures were assigned to an historic zone that encompassed 10

acres of NPS-owned land in Maryland and 25 acres of NPS-managed land in Virginia. Major recommended actions in the Toms Cove Hook Developed Area included realignment of Toms Cove Road, a new bicycle trail from Wildlife Drive to Toms Cove via the east side of the Swan Cove impoundment, and construction of a 200-car parking area, new bathhouse, and picnic area. The GMP called for removal of all structures acquired from owners of retained rights by the NPS. The GMP also recommended that once the natural zone was free of retained rights, wilderness designation would be reconsidered. Today, existing development within the seashore is based upon the direction established in the 1982 GMP, as amended through subsequent plans described below.

The management framework in the preferred alternative in the approved GMP/EIS will replace the management framework in the seashore's initial GMP that has guided seashore management since 1982.

- **ASIS Hurricane Plan**

Preparedness for hurricanes and severe weather is an ongoing process at the seashore. The NPS maintains a hurricane action plan designed to protect human life and property while at the same time attempting minimal disruption of visitor access to the island (NPS 2011b). The plan addresses particular actions which NPS personnel must perform prior to a hurricane and then during the storm's development. Depending upon storm conditions, actions to be taken pertain to: keeping visitors informed about weather conditions; communications with FWS, state park, and local governments; staff readiness; seashore hours of operation; closing seashore facilities; transporting equipment to the mainland; evacuating buildings; securing equipment and information; and evacuating visitors, non-emergency staff, and emergency staff. The superintendent and division chiefs review the plan annually to ensure that it is kept as current as possible.

NPS updates the seashore's hurricane plan annually. Future annual updates would be based upon the management framework included in the preferred alternative in the approved Draft GMP/EIS.

- **Piping Plover (*Charadrius melodus*) Management Plan**

The seashore has implemented a comprehensive management program (NPS 2001b) to conserve breeding populations of the piping plover (*Charadrius melodus),* a "threatened species" added in 1986 to the federal list of threatened or endangered wildlife. The NPS management program seeks to create favorable conditions needed to enhance site selection, nesting, and productivity levels for the piping plover (*Charadrius melodus*) within the seashore. Management actions include pre-season surveys of the island to document vegetative patterns and high probability plover use areas, monitoring, injured and dead specimen assessment, public use area closures, predator exclosures, staff

training, public education, enforcement of plover management regulations, consultation and coordination with the FWS, and annual management program reporting. Monitoring generally begins in mid-April and follows breeding birds and their young from incubation through fledging (generally the 35th day after hatching) in mid to late summer.

The management framework in the preferred alternative in the approved GMP/EIS incorporates and supports recommended management actions to protect the piping plover (*Charadrius melodus*) as included in the *Piping Plover Management Plan* (NPS 2001b).

- **Assateague Beach Coast Guard Station Future Use and Treatment**

The management framework for future use and treatment of the former Assateague Beach U.S. Coast Guard Station (determined eligible for listing on the *National Register of Historic Places*) was established in a 2005 NPS study which considered a range of possible management alternatives for the complex (NPS 2005b). Based on study findings, the management goal is to preserve the historic integrity of the station complex by rehabilitating the structures for adaptive reuse to accommodate research and educational programs. NPS anticipates that new funding resources will become available to augment federal expenditures for maintenance and rehabilitation through partnerships with groups or institutions interested in utilizing the station for compatible research and education activities. In turn, improved station facilities will support enhanced programs of environmental research and education. Rehabilitation of structures will comply with the *Secretary of the Interior's Standards* (NPS 1996).

The preferred alternative in this Draft GMP/EIS incorporates and supports recommended management actions to preserve the historic integrity of the Assateague Beach Coast Guard Station.

- **Fire and Fuels Management Plan**

The *Fire and Fuels Management Plan* (NPS 2005c) provides management guidance to integrate fire management objectives with other resource management programs at the seashore. Guidance addresses wildland fire management preparedness as well as detailed procedural actions to be employed during wildland fire events. At the seashore the suppression of all wildland fire ignitions utilizes an appropriate management response. Firefighters have the option to utilize those control actions that provide them with the best opportunity to suppress a fire, while at the same time allowing them the option to employ suppression strategies and tactics that minimize impacts upon seashore resources, especially those that might result from the suppression activities themselves. The use of prescribed fire, either individually or as part an integrated management approach is utilized to accomplish the full range of natural and cultural

resource management and hazardous fuel reduction goals. Wildland fire may be used in certain circumstances.

NPS typically updates the fire and fuels management plan for the seashore every five years. Future updates would be based upon the management framework included in the preferred alternative in the approved GMP/EIS.

- **Maryland District Alternative Transportation Systems Planning Study**

In 2012 the NPS completed an alternative transportation study for the Maryland District that provides recommendations to improve current transportation conditions and to enhance the transportation system's resiliency (US DOT 2012). Recommended actions are designed to meet the transportation objectives for the seashore, including to: reduce the number of vehicles during peak times within the Maryland developed area; enhance the travel experience for all modes (e.g., wayfinding, traveler information, facilities and amenities); and improve transportation system resiliency to storm damage and sea level rise. Actions also support NPS programmatic goals of resource protection and partnership building and are assumed to be feasible in terms of financial, technical, and public acceptance considerations. Some strategies are recommended for immediate implementation to address current transportation needs, while other strategies require the NPS to begin planning and pursuing funding in preparation for different future conditions when transportation infrastructure could be lost due to natural coastal processes and/or the effects of climate change/sea level rise. The suggested timing for planning and implementing recommended actions reflects consideration of the potential for future damage to the seashore's transportation infrastructure.

Management alternatives considered in this Draft GMP/EIS incorporate the major recommendations of the transportation systems planning study, such as relocation of the seashore's entrance station and implementation of a mainland-based visitor shuttle.

- **Use and Management of the Oversand Vehicle Route and Backcountry Roads**

*Use and Management of the Oversand Vehicle Route and Backcountry Roads* (NPS 2010h) provides a framework for managing off-road vehicle use within the seashore, as well as guidance regarding contemporary use of the seashore's oversand (OSV) vehicle route and backcountry roads. The framework for managing off-road vehicle use within the seashore is provided by Executive Order 11644 (as amended by EO 11989), *NPS Management Policies* (NPS 2006c) section 9.2.3.1, 36 CFR Chapter 1, sections 4.10b and 7.65, and the *Superintendent's Compendium* (NPS 2011i). In general, public OSV use is managed to provide safe and appropriate recreation opportunities while minimizing adverse effects on the seashore's natural, cultural, scenic, and aesthetic resources, and other recreational uses. Administrative off-road vehicle use is limited to that necessary to manage public use of the OSV route and to conduct emergency operations and other

essential maintenance, resource protection, and management activities that cannot be accomplished reasonably by other means.

Management guidance found in the *Use and Management for the Oversand Vehicle Route and Backcountry Roads* (NPS 2010h) would be revised to reflect the management framework in the preferred alternative in the approved Draft GMP/EIS.

- **Long Range Interpretive Plan**

The seashore's long range interpretive plan (LRIP) provides the basis for targeted strategies and actions identified in annual implementation plans to enhance the seashore experience (NPS 2002a). The LRIP identifies the seashore's primary interpretive themes, the desired audience experiences, targeted audiences, issues to be addressed by interpretive actions, collection and library needs, and staffing needs. Since the LRIP was adopted, the NPS has implemented most of the actions identified in the future interpretive program.

The NPS would update the LRIP to identify new strategies and targeted actions to achieve the desired seashore experience associated with the preferred alternative for long-term seashore management in the approved GMP/EIS.

### 1.9.2 U.S. FISH AND WILDLIFE SERVICE PLANS

- **Chincoteague and Wallops Island National Wildlife Refuges Final Comprehensive Conservation Plan and Environmental Impact Statement**

The *Chincoteague and Wallops Island National Wildlife Refuges Final Comprehensive Conservation Plan and Environmental Impact Statement*(CCP/EIS) (US FWS 2015) was released to the public in August 2014 (see section 1.3.3).

### 1.9.3 STATE OF MARYLAND PLANS

- **Assateague State Park Land Unit Plan**

The *Assateague State Park Land Unit Plan* (MD DNR 2005) documents existing resources and improvements at Assateague State Park and provides guidance for resource management and public use at the park through 2015 to 2020. The plan organizes information pertaining to the park, including historical information, visitor survey findings, and existing conditions; identifies issues; identifies management goals; describes strategies to accomplish goals; and provides a framework from which to approach the goals for management of the park (MD DNR 2005). Management goals for the park are:

- to enhance current resource-based recreational opportunities
- to educate the public while providing recreational opportunities

- to identify, conserve, restore, enhance and monitor natural processes, natural resources, sensitive areas, and sensitive species
- to stabilize and replenish the dunes
- to protect historic structures and archaeological artifacts from disturbance
- to improve relationships with other agencies and institutions
- to develop a horse management plan
- to improve environmental sustainability of infrastructure for new and existing structures

Specific management issues identified pertain to dune replenishment, exotic species, wastewater treatment, human/wildlife interaction, and poison ivy/mosquitoes/ticks; recommendations are made to address each of the issues identified. In the future any proposals or issues that may come up that are not addressed in the plan will be handled as a project review proposal that will be scrutinized for compatibility with the goals and strategies identified in the plan (MD DNR 2005). Proposed improvements recommended in the plan include relocation of the nature center; development of a new event pavilion and a new 3.1-mile trail on the mainland; expansion of the boating area to include a canoe/kayak put-in and related rental facilities; and installation of an orientation kiosk.

In the future, NPS would continue to coordinate with MD DNR on a weekly basis regarding seashore management. Over the long-term NPS would implement the management framework associated with the preferred alternative in the approved GMP/EIS by proceeding with contingency planning related to island access and potential relocation of NPS visitor facilities to the mainland. This would involve additional coordination with MD DNR regarding land acquisition and joint development of new NPS facilities on the mainland.

### 1.9.4 LOCAL GOVERNMENT PLANS

- **Worcester County Comprehensive Plan**

Since adopting its current comprehensive plan in 2006, Worcester County's planning philosophy has moved away from an historic emphasis on development to placing a priority on resource conservation and protecting rural and coastal character (Worcester County 2006). The plan's primary goal "is to maintain and improve the county's rural and coastal character, protect its natural resources and ecological functions, accommodate a planned amount of growth served by adequate public facilities, improve development's compatibility and aesthetics, continue the county's prosperous economy, and provide for residents' safety and health." This shift recognizes that critical to the county's quality of life and economy is protection of its rich natural resource base. Recent growth has been significant and has concentrated in the county's northeastern corner where it is now approaching build-out. The plan seeks to establish the basis for continuing a "smart growth" pattern for the future that will continue to

avoid urban sprawl. The plan recommends directing new development to designated growth areas within existing communities where infill development could absorb approximately 18,000 new residents. Protection and conservation of natural and cultural resources will occur through the development review process along with aggressive county participation in conservation programs and resource planning projects, such as the Rural Legacy Program, the Forest Conservation Program, the Maryland Agricultural Land Preservation Program, and the Maryland Coastal Bays Program.

The plan recognizes the importance of Assateague Island to its tourism industry. Projects proposed relevant to the seashore include a recommendation to conduct scenic and transportation corridor planning for Maryland 611 to continue the road's rural and coastal character, particularly from MD 376 to Assateague Island. The plan recognizes the NPS as a partner in the Maryland Coastal Bays Program and in efforts to protect water quality within Chincoteague Bay.

- **Accomack County Comprehensive Plan**

The updated *Accomack County Comprehensive Plan* (Accomack County 2008) supports a vision for the future of Accomack County that recognizes its unique qualities and outstanding potential as a leading agricultural and seafood producer. The plan calls for implementing five key strategies that will focus growth in and around existing communities and away from the shorelines and farmland in order to conserve important agricultural and natural resources. A future land use maps guides all decisions regarding growth, development, and public infrastructure. Specific criteria are recommended to support rezoning decisions that are consistent with the goals of the plan. A variety of policy, regulatory, and programmatic tools are recommended to preserve farmland, shorelines, water resources, and other natural resources. By encouraging expansion of existing communities in a compact mixed-use pattern and by adopting an affordable dwelling unit ordinance, the county hopes to stimulate development of needed affordable housing. Zoning revisions for prospective industrial sites are intended to encourage compatible economic development that promotes expansion of a "distributed workforce" (using broadband internet access) and supports aquaculture and other marine interests by protecting water quality. New and expanded central water and wastewater systems are recommended in specific areas of the county.

The plan does not address issues or recommendations specifically pertaining to Assateague Island National Seashore, although it does recommend that the county cooperate with government organizations to establish a water quality monitoring network in Accomack County.

- **Town of Ocean City Comprehensive Plan**

The Town of Ocean City Comprehensive Plan (Ocean City 2006) recognizes that the majority of the future development of Ocean City will be in the form of redevelopment and that planning should guide future development to enhance Ocean City's vitality as a resort and a community. The plan emphasizes new initiatives for improving the quality of life in the town and the quality of the Ocean City experience for visitors. Future development will be directed to create a quality image of Ocean City by implementing a town-wide urban design, beautification, and landscaping plan. A new design review process is proposed to ensure compatibility of new and redevelopment projects. Recognizing that the local economy is heavily dependent on natural resources, environmental resource protection is identified as a priority including protecting sensitive habitats, reducing water quality impacts from stormwater runoff, and reducing the threat of development to cultural and natural resources. Continuation of the beach replenishment program is recommended to provide storm protection and to support recreational use. Recognizing that future coastal bay quality will depend on close cooperation among all levels of government, the plan commits the town to continue to actively participate in the Maryland Coastal Bays Program and to implement its recommendations as the area develops.

The plan does not address issues or recommendations specifically pertaining to Assateague Island National Seashore.

- **Town of Berlin Comprehensive Plan**

In its new comprehensive plan the town of Berlin recognizes that it is a community with a wealth of resources that is very focused on improving the way of life in a manner that is sustainable for generations to come. The *Town of Berlin Comprehensive Plan* (Berlin 2010) emphasizes the community's desire to reestablish the town's traditional town center through encouraging mixed use downtown and directing future growth into the downtown community or within the existing town boundaries, either as infill growth or where vacancies occur in existing developed areas. Actions are recommended to enhance the major road corridors that attract people into downtown, including MD 818, 346, 376, and 374. The community also recognizes the need to preserve ecologically significant land surrounding the community, especially existing forested lands and wetland areas. Actions are recommended to prohibit potentially harmful development that will affect sensitive areas, including the Maryland Coastal Bays.

The plan does not address issues or recommendations specifically pertaining to Assateague Island National Seashore.

- **Town of Chincoteague Comprehensive Plan**

The town of Chincoteague's new comprehensive plan begins by stating that there is "almost universal consensus throughout the population that the growth of the town should occur in an economically and environmentally sustainable manner" reflecting its "site development and existing building traditions" (Chincoteague 2010). The goals, objectives, and implementation strategies contained in the *Town of Chincoteague Comprehensive Plan* (Chincoteague 2010) represent a community consensus on the path forward to achieve its vision of the future and to accomplish the community's primary goal – "to change over time in an economically sustainable manner so that the town retains the most endearing and unique physical and cultural features and provides the setting for a harmonious community life". Strategies address twelve planning areas, focusing on actions that will ensure that infill and redevelopment are consistent with each area's existing character. Imperative is retaining the existing cluster of businesses located in the town center and encouraging new business start-ups with a focus on retaining the unique pedestrian-oriented characteristics of the area and maintaining its strong link to the waterfront. Recommended actions pertaining to the transportation system focus on improving vehicular circulation by upgrading streets and enhancing connectivity, enhancing local transit service, and developing a community-wide system of bike routes and pedestrian trails. Housing strategies focus on providing affordable housing through several approaches. Recognizing the many issues related to wastewater management, there is a commitment to continue to study the feasibility of public sewer collection and treatment facilities. The possibility of annexing nearby lands

is deemed necessary and expedient for the continued well-being of the community and its residents.

While the plan states that Chincoteague's proximity to Assateague Island National Seashore and the Chincoteague National Wildlife Refuge continues to be its largest economic development opportunity, it does not address issues or recommendations specifically pertaining to either the seashore or the refuge.

### 1.9.5 OTHER PLANS AND PROJECTS

- **North End Restoration Project**

The North End Restoration Project is an ongoing project of the USACE and the NPS to restore the north end of Assateague Island in accordance with a 2001 memorandum of agreement. The project came about as a result of the Water Resources Development Act of 1996 in which Congress directed the Secretary of the Department of the Army to complete a study to determine if the federal navigation project at Ocean City Inlet had contributed to the degradation of the Assateague Island shoreline and, if so determined, to take action to restore the island. Extensive research and analysis conducted during the study determined that, in fact, the federal navigation project at Ocean City Inlet has resulted in significant degradation of northern Assateague Island (USACE 1997). The ensuring plan – referred to as the North End Restoration Project – focuses on restoring Assateague Island to as natural a condition as possible. Development of the restoration proposal was conducted with extensive federal, state, and local agency and public participation as per requirements of the National Environmental Policy Act (NEPA). Two environmental impact statements/feasibility reports were produced to allow full opportunity for public review and comment. The first, released in May 1997, focused on the short-term component of the Assateague restoration program (USACE 1997). The second EIS, completed in July 1998, proposed the long-term restoration component (USACE 1998).

The short-term first phase of the restoration program was designed to provide a one-time infusion of sand to replace a portion of the sediment lost over the past 60 years due to the effects of the jetties. This phase was completed in January 2003 when 1.8 million cubic yards of sand were placed seaward of the mean high waterline to minimize disturbance to upland habitats, widening the beach by about 125 feet over a distance of nearly six miles.

The long-term sand management phase of the restoration project addressed the ongoing and future effects of the jetties by re-establishing a "natural" sediment supply for northern Assateague that reflects historic, pre-inlet rates. Since 2004, sand-bypassing has occurred twice yearly and is providing Assateague with a sediment budget that approximates pre-jetty conditions. After placement in the island's surf zone, natural forces (waves, currents, and storm frequency and intensity) are the dominant

factors dictating how the sand moves within the island and nearshore sand system, and how habitats evolve over time. The annual volume of material and placement locations is adjusted to ensure that geomorphologic conditions and trends meet project objectives. According to the terms of the agreement between the USACE and the NPS the long-term restoration phase is projected to have an economic life of 25 years extending through the year 2028.

This Draft GMP/EIS assumes that the North End Restoration Project would continue as planned through the year 2028.

- **Maryland Coastal Bays Program**

The National Estuary Program was established under Section 320 of the 1987 Clean Water Act Amendments as a U.S. EPA place-based program to protect and restore the water quality and ecological integrity of estuaries of national significance. Portions of the seashore are located within the Maryland Coastal Bays National Estuary, one of 28 national estuaries along the coasts of the Atlantic Ocean, Gulf of Mexico, Pacific Ocean coasts, and Puerto Rico. The management entity responsible for managing the Maryland Coastal Bays National Estuary is the Maryland Coastal Bays Program composed of a partnership among the towns of Ocean City and Berlin, the NPS, Worcester County, the US EPA, and the Maryland Departments of Agriculture, Environment, Planning, and Natural Resources. The Maryland Coastal Bays Program coordinates the work of the partners and stakeholders to restore and protect the estuary. A comprehensive conservation and management plan guides its work, containing specific targeted actions designed to address water quality, habitat, and living resources challenges in its estuarine watershed (MCBP 1999). Management goals of the Maryland Coastal Bays Program generally include (MCBP 2012):

- improve overall water quality by reducing the causes of eutrophication and maintain the water quality in relatively unimpacted areas, such as Chincoteague Bay
- protect existing habitat, restore degraded habitat, and create new habitat to improve reproduction and maintenance of healthy living resource populations
- assess the impact of pathogens and toxic chemicals on living resources and control and/or mitigate those impacts
- promote ecologically sound, sustainable development in order to protect the desired uses and economic vitality of the coastal bays region

Recommended management actions in this Draft GMP/EIS support the long-term management goals of the Maryland Coastal Bays Program.

CHAPTER 2

# ALTERNATIVES


2.1 Development of Alternatives ..... 2-1
2.2 Climate Change Response for Assateague Island ..... 2-3
2.3 Alternative 1 – Continuation of Current Management ..... 2-8
2.4 Management Guidance and Actions Common to the Action Alternatives ..... 2-19
2.5 Alternative 2 – Concentrated Traditional Beach Recreation ..... 2-36
2.6 Alternative 3 – Sustainable Recreation and Climate Change Adaptation ..... 2-47
2.7 Alternative 4 – Natural Island Evolution and a Primitive Island Experience ..... 2-63
2.8 Indicators and Standards ..... 2-76
2.9 Mitigation Measures included in the Alternatives ..... 2-79
2.10 Cost Comparison ..... 2-82
2.11 Comparison of Alternatives ..... 2-84
2.12 Comparison of Impacts of the Alternatives ..... 2-91
2.13 Consistency with Section 101 and 102(1) of NEPA ..... 2-104
2.14 Environmentally Preferable Alternative ..... 2-108
2.15 Identification of the NPS Preferred Alternative ..... 2-108
2.16 Future Planning and Implementation (NPS Preferred Alternative) ..... 2-109

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# 2. ALTERNATIVES

## 2.1 Development of Alternatives

A range of management alternatives are possible for Assateague Island National Seashore that could achieve the seashore's purpose and protect its fundamental and other important resources and values. Working cooperatively with its partners the NPS has developed, evaluated, and compared four reasonable management alternatives. This chapter of the Draft GMP/EIS presents the alternatives, compares their impacts and costs, and identifies the NPS preferred alternative. Data used to compare their impacts – or what would happen if each alternative was adopted – are summarized from the impact analysis presented in chapter 4.

The alternatives include a "no action" alternative – referred to as alternative 1 continuation of current management – and three action alternatives (alternatives 2, 3, and 4). Table 2.1 provides an overview of the concept for each alternative.

**Table 2.1 Overall Management Concepts for the Alternatives**

| Alternative | Alternative Concept Overview |
|---|---|
| **Alternative 1**<br>**Continuation of Current Management** | The NPS would continue to manage seashore resources and visitor uses as it does today, generally reflecting the broad management goals developed by the seashore's 1982 GMP. Decision-making would be based on existing conditions and available information, but lacks a comprehensive planning framework that addresses the full range of contemporary and potential future issues. |
| **Alternative 2**<br>**Concentrated Traditional Beach Recreation** | Most visitors would enjoy traditional beach recreation concentrated within a high density developed area in Maryland accessible by private vehicle. Over time, the size of the developed area would likely shrink, in response to the increasing challenge of protecting recreation facilities in the face of accelerated sea level rise and greater storm intensity. This alternative would likely require significant manipulation of the natural environment to protect facilities and infrastructure in the island developed area. Outside of the developed area, natural processes and the effects of climate change/sea level rise would be the primary forces influencing the condition and evolution of natural resources. |
| **Alternative 3**<br>**Sustainable Recreation and Climate Change Adaptation** | Over time, visitor use infrastructure would evolve to more sustainable designs and likely shift to new, more stable locations both on and off the island. Most recreation uses and activities would continue while new water-based points of access in the seashore's backcountry would enable additional low density visitor use. Natural processes and the effects of climate change/sea level rise would be the primary forces influencing the condition and evolution of natural resources. Alternative 3 represents a long-term shift of park facilities and assets to adapt to climate change. |
| **Alternative 4**<br>**Natural Island Evolution and a Primitive Island Experience** | Visitors would continue to use existing facilities and infrastructure until such time as they are lost and/or damaged by natural coastal processes. Lost facilities would either not be replaced or would be minimally replaced with sustainable substitutes. Visitor use would become almost entirely limited to day-use activities, although some primitive camping would remain. Natural processes and the effects of climate change/sea level rise would be the primary forces influencing the condition and evolution of natural resources. Alternative 4 represents a quicker adaptation of park facilities and assets to the effects of climate change as the seashore shifts from a more traditional developed park to a more primitive park. |

Each action alternative includes a management strategy composed of the following:

- an overall management concept
- management zoning (identification of desired future conditions for subareas (e.g. zones and subzones) within the seashore)
- a summary of management actions that respond to the issues and concerns raised during project scoping and that if implemented would achieve desired conditions within each management zone
- a table summarizing the types of actions needed to achieve desired conditions and a table summarizing the impacts of the actions
- a table summarizing the impacts of the actions
- estimated annual operating and one-time costs

Implicit in all alternatives are the NPS management actions implemented as part of routine seashore operations pursuant to the *NPS Management Policies* (NPS 2006c) and applicable laws, regulations, and servicewide mandates and policies.

Development of the alternatives occurred through a progression of planning steps used by the NPS to prepare GMPs for all units of the national park system, as outlined in the *NPS General Management Planning Dynamic Sourcebook* (NPS 2008b). The seashore's planning team led the process, conducting many internal planning workshops, and hosting scoping sessions with other interested parties, including the general public, local governments, civic organizations, seashore user groups, and various federal, state, and local agencies (section 5.1).

The process initially focused on developing elements of the seashore's foundation plan. These summarize what is most important about the seashore and provide the basic guidance for management decisions made at the seashore (section 1.4). The NPS hosted public events and open house workshops in the summer and fall of 2009 to obtain public comment on the proposed statements of the seashore's purpose, significance, fundamental and other important resources and values, and interpretive themes as part of developing the foundation plan elements. At the 2009 events the NPS also invited the public to assist with identifying management issues.

The GMP planning team subsequently considered strategies needed to address the planning issues and concerns and to accomplish the long-term vision for the seashore. From this emerged the overall management concepts for the action alternatives considered in the Draft GMP/EIS. In the summer of 2011 the GMP/EIS planning team circulated a newsletter that summarized the three preliminary action alternatives and hosted several meetings to obtain public comment on the alternatives. The public was also able to review the alternatives and provide comments on the seashore's website and on the NPS Planning, Environment and Public Comment (PEPC) website. Public comments received at the meetings provided guidance for further refinement of the action alternatives that are described and compared in the GMP/DEIS.

## 2.2 Climate Change Response Strategy for Assateague Island

### 2.2.1 BACKGROUND

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

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

Several executive orders, policies, and plans guide the response to climate change for the seashore as a unit of the national park system:

- *Executive Order 13653* (2013) directs federal agencies to prepare for the impacts of climate change by undertaking actions to enhance climate change preparedness and resilience.
- *Executive Order 13514* (2009) establishes an integrated strategy for sustainability in the federal government and makes reduction of greenhouse gas emissions a priority for federal agencies.
- *Executive Order 11988* (1977) requires federal agencies to avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development.
- *2013 President's Climate Action Plan* (U.S. Executive Office of the President 2013) advises that agencies will be directed to ensure that climate risk management considerations are fully integrated in federal infrastructure and natural resource management planning.
- *Secretarial Order 3289, Amendment 1* (2010) directs each bureau and office of the Department of the Interior to consider and analyze potential climate change impacts when undertaking long-range planning.

- *Department of the Interior Climate Change Adaptation Policy* (523 DM1) outlines a set of principles and provides guidance for integrating climate change adaptation strategies into policies, planning, programs, and operations.
- *NPS Management Policies 2006* (NPS 2006c) §4.7.2 instructs NPS units to collect and maintain baseline climatological data for reference and encourages reduction of greenhouse gas emissions in park operations.
- *NPS Management Policies 2006* (NPS 2006c) §9.1.1 guides sustainable facility planning and development.
- *NPS Climate Change Response Strategy* (NPS 2010d) outlines a four-pronged approach to addressing climate change through science, adaptation, mitigation, and communication.
- *NPS Climate Change Action Plan 2012-2014* (NPS 2012c) details actions and recommendations to implement the climate change response strategy.
- *NPS Green Parks Plan* (NPS 2012d) defines a collective vision and a long-term strategic plan for sustainable management of NPS operations including reducing greenhouse gas emissions and adapting facilities at risk from climate change.
- *NPS Policy Memorandum 12-02: Applying National Park Service Management Policies in the Context of Climate Change* (NPS 2012e) addresses emergent questions regarding the influence of climate change on the guiding principles of park natural resource management.
- *NPS Policy Memorandum 14-02: Climate Change and Stewardship of Cultural Resources* (NPS 2014c) provides guidance and direction regarding stewardship of cultural resources in relation to climate change.
- *NPS Policy Memorandum 15-01: Addressing Climate Change and Natural Hazards for Facilities* (NPS 2015b) provides guidance on the design of facilities to incorporate impacts of climate change adaptation and natural hazards when making decisions in national parks.

### 2.2.2 THE SEASHORE'S CLIMATE CHANGE RESPONSE – GMP/EIS ALTERNATIVES

In crafting the management alternatives for the seashore, the GMP planning team chose to consider climate change and sea level rise as key factors influencing the future of the seashore. While there is uncertainty about the future pace of climate change and sea level rise, there is near consensus among the scientific community that change is underway. Any plan for the future of the seashore must consider the management challenges associated with an increasingly dynamic island landform. This approach is consistent with recent Department of the Interior (DOI) and NPS policy, as summarized above, which calls for incorporation of climate change considerations and response in all levels of planning.

The alternatives developed for this Draft GMP/EIS explore options to provide and protect visitor use and recreation opportunities at the seashore and seek new approaches to providing sustainable access and infrastructure. Barrier islands such as Assateague will

be especially vulnerable to the effects of climate change and sea level rise, and NPS must be able to respond quickly and effectively. Although major impacts are not expected in the near term, now is the time to set the stage so that future managers have options available when conditions and circumstances do change. In the GMP alternatives, seashore managers have explored options, such as constructing roads and parking lots from native materials, mobile facilities, relocation of infrastructure onto the adjacent mainland, and shuttle and ferry services to the seashore.

### 2.2.3 STRATEGIES FOR SEASHORE FACILITIES AND OPERATIONS

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

At the seashore coastal resiliency will be incorporated into all newly developed areas and adaptively reused structures and facilities. While the action alternatives propose a range of facility additions and renovations to expand recreation opportunities, proposed facility investments incorporated into the final approved GMP will be evaluated using climate change strategies that ensure long-term sustainability of investments. Future plans and studies would provide technical data and resource information to support the following strategies:

- Find creative solutions to limit impacts from future flooding, storm surge and other impacts on existing visitor and operations facilities. When these facilities are no longer viable to retain and use, transition to moveable and portable facilities or other means to continue to offer visitor services, as feasible.
- Remove existing visitor facilities and discontinue recreation uses where continued use is unsafe, infeasible, or undesirable due to changing environmental conditions.
- Avoid or minimize additions of new infrastructure, construction of high value assets or major investments in facility renovations within coastal flood or storm surge zones.
- Future improvements on Assateague Island (which is entirely within the 100-year floodplain) and on the mainland will comply with requirements of Executive Order 11988 and with the *Federal Flood Risk Management Standard (FFRMS) Implementing Guidelines* (FEMA 2015, as revised following public review). The new FFRMS will provide additional guidance regarding

management actions at the seashore. This standard will require all future federal investments in and affecting floodplains to meet a level of resilience established by the standard.

- Transition wastewater and sewage treatment systems to more sustainable systems and facilities.
- Use up-to-date policy guidance to respond to changing conditions.

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

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

### 2.2.4 STRATEGIES FOR RESPONDING TO CHANGING CONDITIONS

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

Consistent with DOI policies, the seashore would use an adaptive management framework to respond to the effects of climate change. Temperature and precipitation changes could require NPS to manage the seashore for native biodiversity and ecosystem function instead of managing for specific natural communities. In most cases the seashore would allow natural processes to continue unimpeded, except when public

health and safety or the seashore's fundamental resources and values are threatened. Scenario planning would likely play a pivotal role in developing the seashore's responses to climate change.

The seashore would coordinate with Worcester County, Accomack County, the city of Chincoteague, the town of Ocean City, other nearby communities, and stakeholders while implementing adaptation strategies that support protection, preservation, and restoration of coastal wetlands and natural coastal processes, and that serve as vital tools in buffering coastal communities from the effects of climate change/sea level rise. Some of the strategies that the seashore would pursue, where feasible, include:

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

### 2.2.5 ENGAGING THE SCIENTIFIC COMMUNITY AND VISITORS IN CLIMATE CHANGE

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

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

## 2.3 Alternative 1 – Continuation of Current Management

### 2.3.1 OVERALL CONCEPT

The NPS would continue to manage seashore resources and visitor use as it does today, with no major change in scope or direction. The seashore's enabling legislation, the existing *General Management Plan* (NPS 1982b), and other implementation plans would continue to guide management decision-making. Decisions would be based on existing conditions and available information, but would continue to lack a comprehensive planning framework that addresses the full range of contemporary and potential future issues. Natural coastal processes would continue with minimal interference. Response to breaches and/or new inlet formation would be uncertain, determined on a case-by-case basis taking into consideration laws governing the seashore and a variety of factors such as human safety and protection of property. Dune maintenance in the island developed area in Maryland and other limited actions would protect facilities from storm damage. Visitor use facilities and infrastructure at risk of loss would be moved back from the shoreline. Improvements to visitor facilities and seashore operational facilities would include only projects that are already approved and fully-funded, or compatible with the current direction of seashore management. Altered sand transport processes at Ocean City Inlet would continue to be mitigated through the North End Restoration Project. There would continue to be no systematic response to climate change.

In Virginia, the NPS would continue to support beach-oriented recreation uses in the Island developed area within the Chincoteague National Wildlife Refuge.

### 2.3.2 VISITOR USE AND EXPERIENCE (ALTERNATIVE 1)

Existing interpretive, educational, and management programs providing a range of services to visitors would continue. The seashore's two visitor centers would continue to provide orientation, information, interpretive programs and exhibits, and serve as both destinations and points of departure for day visitors, bus tours, school groups, and campers. Traditional ranger-led activities and curriculum-based educational programs would continue. Programs would continue to emphasize existing interpretive themes; programs would be modified in the future when a planned new long-range interpretive plan becomes available, as appropriate.

The availability of recreation opportunities could change as natural coastal processes and/or the effects of climate change/sea level rise continue to re-shape the island and damage facilities; limited actions would be taken to reclaim lost land area, to replace facilities, or to further protect recreation resources.

Figure 2.1
Seashore Places
Assateague Island National Seashore Boundary
Assateague State Park Boundary
Chincoteague National Wildlife Refuge Boundary
Miles
0
2
4
6
Berlin
Ocean City
Ironshire
North End Backcountry
Maryland Mainland Developed Area (seashore headquarters)
Assateague State Park
Backcountry
Backcountry
Maryland Island Developed Area
Cedartown
Snow Hill
Pocomoke River
Spence
MARYLAND BAY WATERS
MARYLAND OCEAN WATERS
Chincoteague Bay
Backcountry
Girdletree
OSV Use Area
Stockton
WORCESTER COUNTY
Purnell Bay
MARYLAND
VIRGINIA
ACCOMACK COUNTY
Sinnickson
VIRGINIA BAY WATERS
VIRGINIA OCEAN WATERS
Horntown Landing
Chincoteague Bay
Oyster Bay
Atlantic Ocean
Chincoteague National Wildlife Refuge
Chincoteague
Assateague Channel Bridge
Toms Cove
Virginia Assigned Area (Toms Cove Recreational Beach) (limits subject to change by CNWR)
Chincoteague Inlet
Former U.S. Coast Guard Station
Chincoteague National Wildlife Refuge

- **Maryland Island Developed Area**

Visitors would continue to enjoy a variety of traditional beach-oriented recreation activities concentrated within the island developed area in Maryland. Activities would include swimming, sun bathing, fishing, beachcombing, sightseeing, and picnicking, as well as tent and RV camping. Non-personal services would include web-based information and educational resources, site bulletins, exhibits, waysides, and traveling trunks. Although the island developed area is increasingly congested during peak season, managers would continue to lack a comprehensive strategy for addressing overcrowding; aside from the OSV use area, there would be no visitor use limits.

- **Virginia Developed Area**

The NPS would continue to support beach-oriented recreation uses in the Virginia developed area within Chincoteague National Wildlife Refuge. NPS management would occur in accordance with the memorandum of understanding (MOU) between the NPS and the FWS (see appendix B). Traditional recreation uses would be maintained as long as the MOU is in effect and as long as recreation uses are feasible (e.g., there remains suitable land base in the assigned area and funding is available to support beach maintenance). Facilities and infrastructure supporting recreation include access roads and parking lots, shade shelters, rest rooms, changing rooms, rinse off showers, interpretive exhibits, and the Toms Cove Visitor Center. OSV use in Virginia would be as determined by the FWS.

- **North End and Backcountry Areas**

Existing backcountry camping and hiking opportunities would be maintained; access to campsites would be by foot or non-motorized boat only. Day-use on the North End would continue without visitor use facilities or monitoring. The seashore's public hunting program would continue to be managed for its recreation values and as a resource management tool to control non-native sika deer; monitoring would be enhanced to better manage recreational hunting.

- **Oversand Vehicle (OSV) Use Area**

Opportunities for driving on the beach (and associated recreation activities) in Maryland would continue within the seashore's existing designated OSV use area with minimal or no management changes. As long as access exists, there would be no change in the use limit of 145 vehicles in the OSV use area at any one time. Should a breach occur, the response would be uncertain, determined on a case-by-case basis.

### 2.3.3 VISITOR FACILITIES AND INFRASTRUCTURE (ALTERNATIVE 1)

Existing visitor facilities and infrastructure would continue to have varying degrees of sustainability. Decisions regarding the repair and/or replacement of damaged facilities

and infrastructure would generally be based on available funding and only after appropriate climate change and sea level rise risk assessments have been completed.

Larger anticipated improvements to facilities that are funded or are programmed generally include:

- rehabilitation of the seashore's old visitor center as an environmental education center
- various improvements to the seashore administration building
- various improvements to wastewater treatment facilities
- development of suitable housing for seasonal employees in Maryland (17 beds to be added at the existing NPS housing area at the seashore headquarters complex) and in Virginia (14 beds to be added at the FWS mainland maintenance facility)
- wayside replacements
- fencing installation at Oceanside Campground
- shade structure installation (1)
- solar power installations in various facilities
- boardwalk and bike rack replacements

- **Maryland Access and Transportation**

Existing practices which support traditional access to the seashore via private passenger automobile would continue. Alternative transportation via watercraft and bicycles would be encouraged, but with minimal investments. There would be no comprehensive strategy for addressing access and congestion issues, aside from use of variable messaging boards on MD 611 warning visitors when no parking is available on the island in Maryland.

Improvements to the existing transportation system would continue to be made on a routine maintenance basis, including road and bike path repaving, parking lot repairs, bridge repairs, safety enhancements, and minor roadway reconfiguration to enhance efficiency. Access to backcountry campgrounds would be maintained as administrative corridors. Access to former retained rights and to the Green Run Cemetery (for family relatives only) would also be maintained.

### 2.3.4 NATURAL RESOURCE MANAGEMENT (ALTERNATIVE 1)

Existing natural resource related practices and programs would continue. Activities would be largely directed towards the following:

- protecting sensitive species (e.g. predator controls and closures to protect rare, state-listed, and federally-listed threatened and endangered species)
- monitoring resource conditions (e.g. water and air quality, island dynamics, weather)
- mitigating external threats (e.g. water pollution, Ocean City Inlet jetties)

- controlling non-native species (feral horses, sika deer, invasive plants including *Phragmites*)
- restoring habitats impacted by historic land use (e.g. mosquito ditches, former roads, water impoundments, and former hunting camps and private residences determined not eligible for the *National Register*)

Many of these programs and activities would be accomplished in partnership with other federal, state, and local agencies, academic institutions, and non-governmental organizations. Cooperative research would continue to develop new information about and improve understanding of seashore resources and ecological processes. The seashore would not develop a systematic plan for responding to the effects of climate change/sea level rise. Instead, seashore managers would react on a case-by-case basis to address natural resource management needs as conditions change. If a breach occurs, the management response would consider the best science available, applicable NPS policies and laws governing the seashore, and human safety and property concerns.

The NPS would continue to manage the horse population in Maryland as recommended in the *Environmental Assessment of Alternatives for Managing the Feral Horses of Assateague Island National Seashore* (NPS 2008a), including use of contraceptives to achieve and maintain a stable population of 80 to 100 horses. Emphasis would be placed on education and enforcement actions to minimize adverse interactions between horses and visitors.

The NPS would continue to partner with the USACE to implement the North End Restoration Project that mitigates the continuing effects of the Ocean City Inlet and jetties by restoring/maintaining sand supply to northern Assateague Island at the historic, pre-Ocean City inlet rate.

- **Potential and Recommended Wilderness Area**

There would be no change in the size or location of the potential and recommended Assateague wilderness. Management of the potential and recommended wilderness would continue to protect and enhance the character of the area through actions to eliminate incompatible features and activities. Access roads to former retained rights properties would continue to be minimally maintained as administrative use corridors. OSV use in the designated OSV use area would, however, continue to occur within the potential and recommended wilderness area.

- **Ocean and Bay Areas**

Bay and ocean management related actions would include:

- **Research**. Field research and monitoring to document water quality conditions, submerged aquatic vegetation distribution and abundance, tide levels, and other biological indicators would continue.

- **Horseshoe Crab Harvest**. The harvest of horseshoe crabs would continue to occur within the seashore.
- **Aquaculture**. Leasing of submerged lands by the commonwealth of Virginia within the seashore boundary for commercial aquaculture would continue.
- **Privately Owned Structures**. There would continue to be no action related to privately owned structures associated with submerged land leases in Chincoteague Bay within the seashore boundary.
- **Sand Transport**. The USACE would continue to partner with the NPS to address the chronic sand supply impacts to the North End of Assateague Island from the jetty-stabilized Ocean City Inlet.

### 2.3.5 CULTURAL RESOURCE MANAGEMENT (ALTERNATIVE 1)

Existing programs providing basic protection to the seashore's cultural resources would continue consistent with applicable federal and state laws and regulations, NPS policies, and adopted NPS plans for the seashore. The NPS would seek funding to conduct an archeological resource overview and assessment as a first step in identifying currently unknown terrestrial archeological resources. Rehabilitated space would be made available at the headquarters complex for housing the seashore's core museum collections that are not exhibited. Actions would be taken to preserve the seashore's oral history archive for research and use in interpretive media.

- **Assateague Beach U.S. Coast Guard Station**

The former Assateague Beach U.S. Coast Guard Station would continue to be maintained subject to the availability of funding, including adequate maintenance to keep structures in good condition, replacement of electrical service, and repairs to the boat dock consistent with the historic character of the property and the value analysis completed to address damage from Hurricane Sandy. Limited actions in terms of dune stabilization would be taken to protect the structures and cultural landscape from natural coastal processes and/or the effects of climate change/sea level rise.

If damage occurs to historic structures and/or the cultural landscape, the NPS would conduct a value analysis to determine whether or not repairs would be made, taking into consideration the historic significance of the structures and cultural landscape, the level of damage, and the likelihood of further damage from natural coastal processes and/or the effects of climate change/sea level rise. NPS would also follow NPS guidelines for treatment of historic structures likely to be affected by climate change. If it is determined that the historic structures and cultural landscape could no longer be maintained due to recurring damage caused by coastal storms and/or the impacts of climate change/sea level rise, the NPS would likely demolish the structures and rehabilitate the site to foster a return to natural conditions. Prior to demolition, resources would be documented in accordance with the *Secretary of the Interior's*

*Standards for the Treatment of Historic Properties* (NPS 1995c) and other NPS policies, guidelines, and standards.

- **Green Run Lodge**

The NPS would maintain current management practices at Green Run Lodge. The lodge would remain vacant and the NPS would continue basic maintenance and stabilization of the structure. No action would be taken to stabilize the shoreline against future storm damage. If damage occurs to the historic structure, the NPS would conduct a value analysis as described above for the Assateague Beach U.S. Coast Guard Station. If it is determined that the historic structure could no longer be maintained due to recurring damage caused by coastal storms and/or the impacts of climate change/sea level rise, the NPS would likely demolish the structure and rehabilitate the site to foster a return to natural conditions. Prior to demolition, resources would be documented in accordance with the *Secretary of the Interior's Standards* (NPS 1995c) and other NPS policies, guidelines, and standards.

### 2.3.6 SEASHORE OPERATIONS (ALTERNATIVE 1)

Existing management practices related to day-to-day seashore operations would continue. The principal elements would include administrative activities (e.g. human resource management, fee collection, fiscal management, procurement, and IT support), maintenance activities (e.g. utility systems, facility management, fleet maintenance), resource and visitor protection (e.g. visitor use management, public safety, resource protection), resource management (e.g. research, monitoring, mitigation, protection), and interpretation and environmental education.

In Virginia, visitor facilities would likely be increasingly concentrated on a shrinking land mass over time as the existing land base in the assigned area continues to evolve. The location of visitor use facilities could change over time.

### 2.3.7 PARTNERSHIPS (ALTERNATIVE 1)

Existing partnerships and cooperative relationships that support ongoing management programs and activities would continue. Key partners would be Chincoteague National Wildlife Refuge and Assateague State Park. The relationship with the refuge would continue to be governed by existing and future memoranda of understanding, and include cooperation in the provision of visitor services, interpretive services, visitor and resource protection, and facility management in the assigned area within the refuge. The NPS would continue to work with MD DNR to cooperatively manage the seashore and Assateague State Park.

The USACE would continue to partner with the NPS to address the chronic sand supply impacts to the north end of Assateague Island from the jetty-stabilized Ocean City Inlet.

Other important partners would continue to be universities, federal, state and local agencies, and non-governmental entities supporting resource stewardship, research, law enforcement, emergency response, environmental education, community involvement, and seashore operations.

### 2.3.8 LAND ACQUISITION (ALTERNATIVE 1)

No other land acquisition is currently planned.

### 2.3.9 SEASHORE BOUNDARY (ALTERNATIVE 1)

The NPS would continue to work with the Department of the Interior's Office of the Solicitor to assess options to resolve boundary issues associated with the changing location of the island's shoreline.

### 2.3.10 PLANNED AND PROGRAMMED PROJECTS (ALTERNATIVE 1)

Table 2.2 identifies planned and programmed projects included in alternative 1.

### 2.3.11 COSTS (ALTERNATIVE 1)

The NPS has prepared estimates of annual operating costs and one-time costs associated with alternative 1 using NPS and industry cost estimating guidelines (see table 2.11 in section 2.10). Annual recurring costs include personnel and non-labor costs, such as utilities, vehicles, travel, and supplies. One-time capital investments include construction, exhibits, research, and planning. These costs are presented for comparative purposes only and will be refined at a later date based upon final design of facilities and other considerations. Some projects have the potential to be funded through partnerships and volunteers, or through shared funding with other agencies. Therefore, actual costs would vary depending on when specific actions are implemented and on contributions by partners and volunteers.

- **NPS Annual Operating Costs and Staffing Requirements**

NPS annual operating costs associated with alternative 1 are estimated to be $5,255,000 (2013 dollars). This includes the anticipated cost for staff salaries and benefits for 41 full-time equivalent (FTE) staff, utilities, supplies, services, and other materials needed for seashore maintenance and operations. The FTE number indicates funded NPS staff only, and does not include volunteer positions, positions funded by partners, or staff hired by NPS with other funds, such as Federal Land Recreation Enhancement Act fees, 54 U.S.C. 101702 funds (commonly referred to as "living exhibits and interpretive demonstrations" fees), special use permit fees, and commercial use authorization funds.

- **One-Time Costs**

Total one-time costs associated with alternative 1 are estimated to be $29,148,160 (2013 dollars) including one-time facilities costs and non-facilities costs.

The NPS share of these one-time costs is estimated at approximately is $25,028,077 (86% of total one-time costs). Major facilities costs include those for:

- administrative offices rehabilitation
- maintenance facilities rehabilitation
- environmental education center rehabilitation
- housing for seasonal employees on the mainland in Maryland and Virginia
- boat dock repairs at the former Assateague Beach U.S. Coast Guard Station

Major non-facilities costs include those for:

- enhancing seashore recreation opportunities by restoring island habitats and processes altered by past non-NPS development activities
- relic mosquito ditch restoration
- phragmites control
- saltmarsh restoration

Total one-time partner costs are estimated at approximately $4,120,083 (14% of total one-time costs) (2013 dollars). Major partner costs include those for:

- road and parking area pavement management projects (FHWA)
- repairs to Virginia bridges (FHWA)
- bike path extension (FWS to the Virginia Assigned Area) (FHWA)

**Table 2.2 Alternative 1 – Planned and Programmed Projects**

| | | Planned and Programmed Actions |
|---|---|---|
| **Seashore-Wide Topics** | **Natural Resource Management** | ▪ enhance piping plover (*Charadrius melodus*)success through predator control<br>▪ control *Phragmites australis*<br>▪ restore saltmarsh function by filling relic mosquito ditches<br>▪ remove abandoned roads and properties of no historic or park mission value<br>▪ pursue new NPS initiatives pertaining to research and monitoring of marine/oceanic resources<br>▪ establish a groundwater monitoring program<br>▪ continue to monitor the distribution and abundance of submerged aquatic vegetation<br>▪ survey distribution, abundance and habitat of rare species (e.g., tiger beetles)<br>▪ implement a hunting monitoring program |
| | **Cultural Resource Management** | ▪ preserve oral history archive for research and use in interpretive media<br>▪ complete a seashore wide archeological overview and assessment |
| | **Visitor Experience Enhancements** | ▪ complete new long-range interpretive plan<br>▪ replace deteriorated wayside exhibits<br>▪ develop an enhanced environmental education program<br>▪ provide a recreational kayak program<br>▪ modify existing facilities to meet ADA specifications |
| | **Other Special Studies** | (no actions identified) |
| **Developed Area** | **Maryland Island Developed Area** | ▪ relocate South Ocean Beach parking lot and Bayside parking lot to improve sustainability<br>▪ make miscellaneous improvements to the transportation system (roads, bike paths, bridges) for safety management and pavement management<br>▪ make miscellaneous improvements to campground wastewater treatment facilities<br>▪ install solar electric service in bath houses, beach hut, and visitor contact station<br>▪ install shade structure<br>▪ install shaded interpretive structure and portable pedestrian shelters<br>▪ install new fencing at Oceanside Campground |
| | **Maryland Mainland Developed Area** | ▪ install tertiary system to discharge wastewater<br>▪ complete initial actions to rehabilitate the environmental education center<br>▪ complete initial actions to rehabilitate the seashore headquarters complex<br>▪ make improvements to provide suitable storage for the seashore's museum collection<br>▪ provide suitable housing on the mainland for seasonal employees (17 beds) |
| | **Assateague State Park** | ▪ cooperate with Assateague State Park on coastal storm planning and response, feral horse management, and other issues and opportunities of mutual interest |
| | **Virginia Assigned Area** | ▪ make miscellaneous improvements to the transportation system (roads, bike paths, bridges) for safety management and pavement management<br>▪ replace boardwalks and bike racks<br>▪ make emergency repairs as needed to repair storm damage<br>▪ extend bike path to Virginia Assigned Area (by FHWA) |
| | **Virginia Mainland (FWS Maintenance Facility)** | ▪ provide suitable housing on the mainland for seasonal employees (14 beds)<br>▪ rehabilitate Virginia maintenance garage vehicle wash bay (on mainland) |
| **Backcountry Area** | **Primary Area** | ▪ maintain Hungerford's House as a backcountry research facility<br>▪ restore island habitats and processes altered by past development activities (e.g. six former hunting lodges, two former private residences, roads, impoundments, ditches) |
| | **OSV Use Area** | (no actions identified) |
| | **Wilderness** | ▪ continue to protect and enhance the character of the potential and recommended wilderness through actions to eliminate incompatible features and activities (no change in the size or location of the potential and recommended wilderness) |

**Table 2.2 Alternative 1 – Planned and Programmed Projects (continued)**

| | | Planned and Programmed Actions |
|---|---|---|
| **Cultural Resource Area** | **Primary Area** | ▪ at the former Assateague Beach U.S. Coast Guard Station:<br>- continue to maintain resources subject to availability of funding (including repairs to boat dock and replacement of electric services) until no longer sustainable in the context of natural coastal processes and/or the effects of climate change/sea level rise, pending the outcome of a value analysis after each storm event<br>- implement limited actions to protect resources at the Coast Guard Station to protect resources from natural coastal processes and /or effects of climate change/se level rise<br>▪ at the former Green Run Lodge<br>- continue basic maintenance<br>- no actions to protect resource from natural coastal processes and /or effects of climate change/se level rise |
| **Central Chincoteague Bay** | **Primary Area** | ▪ continue to monitor the distribution and abundance of submerged aquatic vegetation<br>▪ existing prohibition on unauthorized commercial harvest of horseshoe crabs would not be enforced<br>▪ commercial aquaculture leasing and commercial finfishing would continue in Virginia<br>▪ no action would be taken related to privately owned structures in Virginia waters |
| **Sinepuxent and Southern Chincoteague Bay** | **Primary Area** | ▪ continue to monitor the distribution and abundance of submerged aquatic vegetation<br>▪ continue to implement the North End Restoration Project to mitigate environmental impacts of the Ocean City Inlet jetties and the Ocean City Inlet (with USACE)<br>▪ existing prohibition on unauthorized commercial harvest of horseshoe crabs would not be enforced<br>▪ commercial aquaculture leasing and commercial finfishing would continue in Virginia<br>▪ no action would be taken related to privately owned structures in Virginia waters<br>▪ |
| **Atlantic Ocean** | **Primary Area** | (no actions identified) |

## 2.4 Management Guidance and Actions Common to the Action Alternatives (Common to Alternatives 2, 3, and 4)

A number of management actions are common to all action alternatives (alternatives 2, 3, and 4) and therefore, are described here rather than repeated under each action alternative description. The following section 2.4 identifies the common actions, including management zoning, desired conditions, and specific management actions. These common actions are in addition to the actions described for each alternative in section 2.5 (alternative 2), section 2.6 (alternative 3), and section 2.7 (alternative 4). Note that all planned and programmed actions included in alternative 1 (table 2.2) are also included in and are common to the three action alternatives. Also note that any proposed new visitor facilities development, rehabilitation, or post-storm reconstruction described below would be undertaken only after appropriate climate change and sea level rise risk assessments have been completed. A more detailed examination of these factors would influence the type, design, location, and ultimate feasibility of any proposed project.

### 2.4.1 MANAGEMENT ZONING AND DESIRED CONDITIONS (COMMON TO ALTERNATIVES 2, 3, AND 4)

The NPS uses management zones to describe the resource conditions and desired visitor experiences to be achieved in various areas of a park. For each management zone there are two components:

- a statement of the general management approach
- a set of desired future conditions

For Assateague Island National Seashore, there are six management zones (table 2.3).

- development zone (including two subzones)
- natural resource zone (including two subzones)
- cultural resource zone
- Chincoteague Bay Zone
- Sinepuxent and Southern Chincoteague Bay Zone
- Atlantic Ocean Zone

Chincoteague National Wildlife Refuge and Assateague State Park are excluded from the management zones.

For each management zone, the desired future conditions provide a qualitative description of the integrity and character of resource conditions, visitor experience, and access and development that seashore managers propose to achieve and maintain (table 2.4).

The three action alternatives (alternatives 2, 3, and 4) each use this set of management zones and associated desired future conditions. Because the overall concept for each alternative differs (sections 2.5.1, 2.6.1, and 2.7.1), the locations where zones apply, the

**Table 2.3 Management Zone Summary – Common to Alternatives 2, 3, and 4**

| Zone | Subzone | General Management Approach |
|---|---|---|
| **Development Zone** | **Primary Zone** | Managed to provide traditional recreational and educational opportunities and support moderate to high density visitor use in an altered but natural appearing setting. Most facilities and infrastructure are restricted to this zone. In Maryland the zone includes the island developed area (including the ocean beaches) and the mainland developed area (including the seashore headquarters complex and visitor center). In Virginia the zone includes the two NPS-owned bridges connecting Chincoteague Island and Assateague Island and associated roads. |
| | **Virginia Assigned Area Subzone** | Managed to provide traditional recreational opportunities and support high density visitor use in an altered but natural appearing setting. Management must be in keeping with the purposes of the Chincoteague National Wildlife Refuge and is governed by a memorandum of understanding with the U.S. Fish and Wildlife Service. |
| **Natural Resource Zone** | **Primary Zone** | Managed for resource protection and low density, low impact recreation dependent on high quality resource conditions. May include primitive backcountry campsites and bayside points of access for motorized vessels and/or non-motorized vessels; both of which may be associated with maintained cross island sand trails. May also include the adaptive use of existing structures and/or development of primitive facilities for research and environmental education.<br>The zone includes all terrestrial areas not encompassed by the development and cultural resource zones and may be further classified as one of two subzones: active beach recreation or resource preservation.<br>The zone and its two subzones may include isolated cultural resources, including archeological sites and historic structures. |
| | **Active Beach Recreation Subzone** | Managed for resource protection and traditional beach-oriented recreation access using off-road vehicles. |
| | **Resource Preservation Subzone** | Managed to preserve, restore, and enhance natural ecosystem conditions and processes, qualities of wilderness character, and to provide opportunities for low density, low impact recreation uses dependent on pristine resource conditions. May include primitive backcountry campsites and bayside points of access. |
| **Cultural Resource Zone** | **Primary Zone** | Managed to provide appropriate levels of protection to locally and regionally significant cultural resources and compatible opportunities for visitor access and interpretation. Includes NPS managed lands in Virginia associated with the former Assateague Beach U.S. Coast Guard Station, including historic structures, archeological resources, and cultural landscape. Also includes the area encompassing the former Green Run Lodge, Green Run Village Graveyard, Green Run Campground, and the associated cross-island access sand road. |
| **Central Chincoteague Bay** | **Primary Zone** | Managed to protect, restore, and enhance the natural estuarine environment and provide opportunities for low density water-based visitor use and appropriate commercial use. Includes the waters of Chincoteague Bay north of Wildcat Point to the southern tip of South Point within the authorized seashore boundary. |
| **Sinepuxent and Southern Chincoteague Bay** | **Primary Zone** | Managed for resource protection and compatible water-based recreation activities. Seeks to improve conditions for water based activities by working cooperatively with the states of Maryland and Virginia to provide opportunities for water-based visitor use and appropriate commercial use. Includes the waters of Sinepuxent Bay (Ocean City Inlet to the southern tip of South Point) and Chincoteague Bay south of Wildcat Point to Chincoteague Inlet within the authorized seashore boundary. Also includes portions of Ocean City Inlet and Chincoteague Inlet within the authorized park boundary. May include areas where personal watercraft use is permitted. |
| **Atlantic Ocean** | **Primary Zone** | Managed for resource protection and compatible water-based recreation activities. Seeks to improve conditions for water-based activities by working cooperatively with the states of Maryland and Virginia to provide opportunities for water-based visitor use and appropriate commercial use. |

management emphasis within zones, and the manner in which desired future conditions are achieved and maintained also differ. When considering the three proposed action alternatives for the seashore, there are three important observations about how the zones are applied:

- all activities and facilities appropriate in a management zone or subzone may not be allowed or constructed everywhere a management zone or subzone occurs (e.g. some activities and facilities may be limited to certain areas within a zone or subzone)
- management zones are the same in each alternative, with the following exceptions:
  - on the mainland the development zone differs from alternative to alternative
  - in the backcountry the natural resource zone and two related subzones differ from alternative to alternative
- while some zones and subzones in the alternatives are the same in terms of their location, what may actually happen in each zone would vary from alternative to alternative, reflecting the underlying primary ideas of each alternative concept

### 2.4.2 COMMUNITY RESILIENCE (COMMON TO ALTERNATIVES 2, 3, AND 4)

- **Understanding Impacts of Sea Level Rise and Storm Surge**

NPS would work in cooperation with other federal agencies, the states, counties and communities to explore how best to model the impacts of sea level rise and storm surge. These efforts would evaluate potential effects of breach management, modifications to infrastructure and other related actions on local communities and infrastructure. Together, stakeholders would explore ways to mitigate hazards and increase the resiliency of surrounding communities and infrastructure. This effort would make use of new information regarding sea level rise available from various sources, such as the U.S. Geological Survey's new model to predict long-term shoreline change associated with sea level rise and data defining the geological framework of the Delmarva Peninsula developed through geophysical mapping of the inner continental shelf.

- **Breach Management Plan**

The NPS would develop a breach management plan to guide NPS's response to future breaches on the island. The plan would specify the conditions under which NPS would allow breaches to remain open or would allow breach closures. It would be based on the best science available and conform to the mission of the NPS and laws governing the seashore. It would also consider other important elements such as human safety and protection of property. While completion of a breach management plan would be common to alternatives 2, 3, and 4, the protocols for responding to breaches would

**Table 2.4 Desired Conditions by Management Zone and Area – Common to Alternatives 2, 3, and 4**

| Development Zone | | | |
|---|---|---|---|
| | **Resource Conditions** | **Visitor Experience** | **Access and Development** |
| **Primary Zone** | The Developed Zone supports high density visitor use and/or administrative operations. The areas are managed for visitor access and use, and for seashore operations in ways that blend with and protect the visual and aesthetic qualities of the natural environment.<br>▪ Natural resources are managed to maintain a largely natural appearance but may be modified to support visitor use facilities and activities, and seashore operational needs.<br>▪ There is some tolerance for impacts to non-sensitive resources.<br>▪ Natural processes can be manipulated to protect facilities and infrastructure.<br>▪ The sights and sounds of human activity are fairly obvious and frequently supplant the sights and sounds of nature.<br>▪ Sensitive natural and cultural resources are uncommon but, if present, are fully protected.<br>▪ The protection of sensitive species and habitats is given precedence over visitor use to protect sensitive species and habitats and to educate visitors about sensitive species and habitats. | The Developed Zone provides opportunities for visitors to receive orientation and information, interact with seashore staff, experience and learn about seashore resources, and engage in recreation activities.<br>▪ Appropriate visitor activities can include sightseeing, swimming, sunbathing, walking, camping, bird watching, fishing, picnicking, participating in educational activities, and experiencing resources.<br>▪ Visitors see native flora and fauna, but are experiencing a modified environment.<br>▪ Interpretive and educational opportunities, both self-directed and structured, are focused in these areas.<br>▪ Special events and activities are allowed with appropriate permits.<br>▪ The likelihood of encountering other visitors is high.<br>▪ Visitor activities are regulated to protect elements of the natural environment, prevent visitor conflicts, and enhance public safety.<br>▪ Commercial services are appropriate in these areas. | The Developed Zone includes facilities and infrastructure to support high density visitor use and/or administrative operations. Facilities are compatible with the natural landscape in size and scale, are sustainable, and are the minimum needed to accommodate the intended purposes.<br>▪ Visitor facilities can include kiosks, visitor contact stations and centers, wayside exhibits, observation platforms, nature trails, and educational facilities.<br>▪ Visitor support facilities can include signs, roads, parking lots, boardwalks, boat launch ramps, restrooms, air stations, picnic areas, and campgrounds.<br>▪ Administrative facilities can include maintenance shops, utility systems, offices, buildings, staff housing, parking lots, roads, and storage areas.<br>▪ Modes of public access are compatible with the protection of seashore resources and values, sustainable, and sufficient to support large numbers of visitors. |
| **Virginia Assigned Area Subzone** | The Virginia Assigned Area Subzone supports high density visitor use and administrative operations. The subzone differs from the Primary Developed Zone in the following ways:<br>• It applies to lands within the assigned area in Virginia as defined by the CNWR.<br>• When sensitive natural and cultural resources are present in the Subzone, they are fully protected in collaboration with Chincoteague National Wildlife Refuge.<br>• Visitors are educated about sensitive resources and areas where and when appropriate. | | |
| **Natural Resource Zone** | | | |
| | **Resource Conditions** | **Visitor Experience** | **Access and Development** |
| **Primary Zone** | The Natural Resource Zone is managed to protect, restore, and enhance the natural barrier island environment and provide opportunities for low density, low impact visitor use activities.<br>▪ Natural conditions predominate and there is low tolerance for resource impacts; existing impacts are mitigated, as feasible. | The Natural Resource Zone provides visitors with opportunities for a range of recreation activities in a predominantly natural setting with greater opportunities for solitude and discovery than in the Development Zone.<br>▪ Appropriate visitor activities include sightseeing, swimming, beachcombing, hiking, primitive camping, fishing, experiencing | The Natural Resource Zone has limited facilities and infrastructure. Those facilities present are compatible with the natural landscape in size and scale, are sustainable, and are the minimum needed to accommodate the intended purpose of supporting seashore operations and low density, low impact visitor use.<br>▪ Visitor support facilities can |

**Table 2.4 Desired Conditions by Management Zone and Area – Common to Alternatives 2, 3, and 4 (cont)**

| Natural Resource Zone (continued) | | | |
|---|---|---|---|
| | **Resource Conditions** | **Visitor Experience** | **Access and Development** |
| | ▪ Natural processes are allowed to occur unimpeded. If impacted, processes are restored or mitigated.<br>▪ Resource management seeks to maintain all components and processes of naturally evolving park ecosystems, including natural abundance, diversity, and genetic and ecological integrity of plant and animal species native to those ecosystems.<br>▪ Evidence of human impacts are infrequent and limited in extent.<br>▪ The protection of sensitive species and habitats is given precedence over visitor use.<br>▪ Natural sights and sounds dominate, although the sights and sounds of adjacent lands and other visitors intrude in certain areas.<br>▪ Protecting resource conditions and ecosystem integrity is a high priority. | resources, and hunting (except in primitive camping areas).<br>▪ Visitors experience most aspects of a natural barrier island environment with natural sights and sounds, although the sights and sounds of adjacent lands and other visitors may sometimes intrude.<br>▪ Visitors can see cultural resources.<br>▪ The likelihood of encountering other visitors is low to moderate.<br>▪ Visitor activities are regulated to protect the natural environment, prevent visitor conflicts, and enhance public safety.<br>▪ There are few structured interpretation and education opportunities, although ranger-led programs including environmental education camps may be appropriate.<br>▪ Visitors can access remote areas of the seashore with opportunities for exploration, discovery, and self-directed learning. | include signs, sand roads and trails, boat docks, boardwalks, launch ramps for motorized and/or non-motorized boats, hunting blinds, restrooms, and primitive campgrounds.<br>▪ Administrative facilities can include sand roads, research quarters, research and resource management apparatus, and environmental education facilities.<br>▪ Visitor access is by foot only, except in the Active Beach Recreation Subzone. |
| **Active Beach Recreation Subzone** | The Active Beach Subzone is managed for resource protection and traditional beach-oriented recreation access using off-road vehicles. The Active Beach Preservation Subzone differs from the primary Natural Resource Zone in the following ways:<br>▪ In addition to the other listed visitor activities in the primary zone, off-road driving and primitive RV camping is allowed and hunting is be permitted.<br>▪ Natural sights and sounds dominate, although the sights and sounds of human activities, particularly motor vehicles, often intrude. Evidence of human use and activities are more often apparent.<br>▪ The likelihood of encountering other visitors is moderate to high.<br>▪ There are no facilities and limited infrastructure in the subzone. Infrastructure is the minimum needed to accommodate the intended purposes and can include signs and markers, sand roads, and gates.<br>▪ Visitor access within the subzone occurs via off-road vehicle and foot. | | |
| **Resource Preservation Subzone** | Resource Preservation Subzone is managed to preserve, restore, and enhance natural ecological conditions and qualities of wilderness character while providing limited opportunities for low density, low impact primitive recreation experiences. The Resource Preservation Subzone differs from the primary Natural Resource Zone in the following ways:<br>▪ Qualities of wilderness character are protected and, as feasible, enhanced through elimination of incompatible features and activities. Unnatural features (e.g. non-historic structures, roads associated with former development, ditches, and impoundments) are removed and affected areas are restored to as natural a condition as possible.<br>▪ Visitors have opportunities to see and experience natural barrier island conditions and those areas of the seashore possessing qualities of wilderness character. Visitors are in close contact with the rich resources of the seashore, and have opportunities for solitude, adventure, discovery, and self-directed learning.<br>▪ There are no facilities or infrastructure other than temporary structures such as signs, fences, markers, primitive campsites, research, and resource management apparatus, etc. | | |

**Table 2.4 Desired Conditions by Management Zone and Area – Common to Alternatives 2, 3, and 4 (cont)**

| Cultural Resource Zone | | | |
|---|---|---|---|
| | **Resource Conditions** | **Visitor Experience** | **Access and Development** |
| **Cultural Resource Zone** | The Cultural Resource Zone is managed for resource protection and the potential for compatible adaptive use of historic structures for research and education.<br>▪ Historic buildings and structures are protected, accessible, and maintained to preserve a high degree of integrity.<br>▪ Interior features of historic structures can be modified to fulfill adaptive uses.<br>▪ Cultural landscapes are protected and restored.<br>▪ Archeological resources are identified and evaluated for *National Register* eligibility.<br>▪ There is some tolerance for impacts to non-sensitive natural resources if necessary for the protection of cultural resources. | The Cultural Resource Zone provides visitors with the opportunity to see, and learn about certain aspects of the seashore's cultural and natural heritage.<br>▪ Appropriate visitor activities include sightseeing, walking, and experiencing and learning about cultural resources.<br>▪ Self-directed interpretive and educational opportunities are available to visitors. Structured programs are appropriate.<br>▪ Visitors see and experience natural resources.<br>▪ The likelihood of encountering other visitors is low to moderate.<br>▪ Visitor activities are regulated to protect cultural resources and the environment, prevent visitor conflicts, and enhance public safety. | The Cultural Resource Zone has limited facilities and infrastructure outside of adaptively reused historic structures. Non-historic facilities are compatible with the surrounding features and cultural landscape in size and scale, are sustainable, and are the minimum needed to accommodate the intended purpose of supporting low density, low impact visitor use.<br>▪ Visitor facilities can include kiosks, wayside exhibits, walking trails, and boardwalks.<br>▪ Visitor support facilities can include signs, restrooms, picnic areas, and docking/mooring infrastructure.<br>▪ Administrative facilities are limited to utility systems, access roads, and parking areas.<br>▪ Modes of public access are available to support low to moderate numbers of visitors. |
| **Central Chincoteague Bay Zone** | | | |
| | **Resource Conditions** | **Visitor Experience** | **Access and Development** |
| **Central Chincoteague Bay Zone** | The Central Chincoteague Bay Zone is managed to protect, restore and enhance the natural estuarine environment and provide opportunities for low density, low impact water-based visitor use, and recreation.<br>▪ Natural conditions predominate and there is a very low tolerance for resource modifications or degradation.<br>▪ Natural processes are allowed to occur unimpeded. If impacted, processes are restored or mitigated.<br>▪ Resource management seeks to maintain all components and processes of naturally evolving park ecosystems, including natural abundance, diversity, and genetic and ecological integrity of plant and animal species native to those ecosystems.<br>▪ Evidence of human impacts are infrequent and limited in extent; unauthorized features are removed and natural conditions restored.<br>▪ Natural sights and sounds dominate, | The Central Chincoteague Bay Zone provides visitors with opportunities to see and experience a natural estuarine environment, and water-based access to the most remote and pristine portions of the island.<br>▪ Appropriate visitor activities include canoeing, kayaking, boating, swimming, snorkeling, fishing, clamming, crabbing, and experiencing resources.<br>▪ Visitors experience the natural abundance, diversity, and genetic and ecological integrity of the plant and animal species native to the estuary ecosystem.<br>▪ Natural sights and sounds predominate, although the sights and sounds of other users can occasionally intrude.<br>▪ The likelihood of encountering other visitors is low.<br>▪ Visitors are in close contact with the rich resources of the seashore, and have opportunities for solitude, adventure, discovery and self-directed learning.<br>▪ Conflicts between motorized and | The Central Chincoteague Bay Zone has limited facilities and infrastructure. Those facilities present are compatible with the natural landscape in size and scale, are sustainable, and are the minimum needed to achieve the intended purpose of supporting low impact, low density visitor use.<br>▪ Visitor facilities can include hunting blinds.<br>▪ Visitor support facilities can include signs, markers, and docking/mooring infrastructure.<br>▪ Administrative facilities are limited to research and resource management apparatus.<br>▪ Visitor access within the zone is by motorized and non-motorized vessels. |

**Table 2.4 Desired Conditions by Management Zone and Area – Common to Alternatives 2, 3, and 4 (cont)**

| Central Chincoteague Bay Zone (continued) | | | |
|---|---|---|---|
| | **Resource Conditions** | **Visitor Experience** | **Access and Development** |
| | although the sights and sounds of other users can occasionally intrude.<br>▪ Visual characteristics are protected and, as feasible, enhanced through the elimination of incompatible features and activities.<br>▪ Protecting resource conditions and ecosystem integrity are the highest management priority.<br>▪ Desired conditions for shellfish are achieved through collaboration with the states and partners. | non-motorized boaters are rare.<br>▪ Visitor activities are regulated to protect elements of the natural environment, prevent visitor conflicts, and enhance public safety.<br>▪ There are few structured interpretation and education opportunities.<br>▪ States continue to manage shellfishing. | |
| **Sinepuxent and Southern Chincoteague Bay Zone** | | | |
| | **Resource Conditions** | **Visitor Experience** | **Access and Development** |
| **Sinepuxent and Southern Chincoteague Bay Zone** | The Sinepuxent and Southern Chincoteague Bay Zone is managed for resource protection and low to moderate density water-based recreation.<br>▪ Natural conditions predominate and there is a low tolerance for resource impacts; if feasible, existing impacts are mitigated.<br>▪ Natural processes are allowed to occur unimpeded. If impacted, processes are restored or mitigated<br>▪ Resource management seeks to maintain all components and processes of naturally evolving park ecosystems, including natural abundance, diversity, and genetic and ecological integrity of plant and animal species native to those ecosystems.<br>▪ Evidence of human impacts are minimal and limited in extent. The sights and sounds of human activity are fairly obvious in some locations and may supplant the sights and sounds of nature.<br>▪ Protecting resource conditions and ecosystem integrity are high priorities<br>▪ Desired conditions for shellfish are achieved through collaboration with the states and partners. | The Sinepuxent and Southern Chincoteague Bay Zone provides visitors with opportunities for a range of water-based recreation activities in a predominantly natural setting, and water-based access to remote portions of the island.<br>▪ Appropriate visitor activities include canoeing, kayaking, boating, swimming, snorkeling, fishing, clamming, crabbing, participating in educational activities, and visitor resources.<br>▪ Visitors experience the natural abundance, diversity, and ecological integrity of plant and animal species native to the estuary ecosystem.<br>▪ Natural estuarine environment with natural sights and sounds predominate, although the sights and sounds of adjacent lands and other visitors can intrude.<br>▪ Interpretive and educational opportunities related to the seashore's estuarine resources, both self-directed and structured, are focused in these areas.<br>▪ The likelihood of encountering other visitors is moderate.<br>▪ Conflicts between motorized and non-motorized boater are minimal.<br>▪ Visitor activities are regulated to protect elements of the natural environment, prevent visitor conflicts, and enhance public safety.<br>▪ Commercial services can be appropriate in these areas.<br>▪ States continue to manage shellfishing. | The Sinepuxent and Southern Chincoteague Bay Zone has limited facilities and infrastructure. Those facilities present are compatible with the natural landscape in size and scale, are sustainable, and are the minimum needed to achieve the intended purpose of supporting low to moderate density visitor use.<br>▪ Visitor facilities can include hunting blinds.<br>▪ Visitor support facilities can include signs, markers, and docking/mooring infrastructure<br>▪ Administrative facilities are limited to research and resource management apparatus.<br>▪ Visitor access within the zone is by motorized and non-motorized vessels. |

**Table 2.4 Desired Conditions by Management Zone and Area – Common to Alternatives 2, 3, and 4 (cont)**

| Atlantic Ocean Zone | | | |
|---|---|---|---|
| | **Resource Conditions** | **Visitor Experience** | **Access and Development** |
| **Atlantic Ocean Zone** | The Atlantic Ocean Zone is managed to protect, restore, and enhance the ocean environment and provide opportunities for water-based visitor use and recreation.<br>▪ Natural conditions predominate and there is a low tolerance for resource modifications or degradation.<br>▪ Natural processes are allowed to occur unimpeded. If impacted, processes are restored or mitigated.<br>▪ Resource management seeks to maintain all components and processes of naturally evolving park ecosystems, including natural abundance, diversity, and genetic and ecological integrity of plant and animal species native to those ecosystems.<br>▪ Evidence of human activities is infrequent and limited in extent.<br>▪ Natural sights and sounds predominate, although the sights and sounds of adjacent lands can intrude in certain areas.<br>▪ Visual characteristics of the open ocean are protected and, as feasible, enhanced through the elimination of incompatible features and activities.<br>▪ Protecting resource conditions and ecosystem integrity are a high priority. | The Atlantic Ocean Zone provides visitors with opportunities to see and experience a natural near-shore ocean environment.<br>▪ Appropriate visitor activities include swimming, surfing, fishing, kayaking, boating, diving, and experiencing resources.<br>▪ Visitors experience the natural abundance, diversity, and genetic and ecological integrity of the plant and animal species native to the ocean ecosystem.<br>▪ Natural ocean environment with natural sights and sounds although the sights and sounds of adjacent lands and other users can intrude in certain areas.<br>▪ The likelihood of encountering other visitors is low to high.<br>▪ Visitor activities are regulated to protect elements of the natural environment, protect sensitive species and habitat, prevent visitor conflicts, and enhance public safety.<br>▪ There are few structured interpretation and education opportunities except at the interface with island developed zones.<br>▪ States continue to manage shellfishing. | The Atlantic Ocean Zone has no facilities or infrastructure except navigation markers.<br>▪ Visitor access within the zone is by motorized and non-motorized vessels. |

differ, reflecting the specific climate change adaptation philosophy inherent in each alternative.

The breach management plan would reflect existing NPS policy for shorelines and barrier islands found in section 4.8.1.1 of *NPS Management Policies* (NPS 2006c). NPS policy generally stipulates that natural coastal processes such as erosion, deposition, dune formation, overwash, inlet formation, and shoreline migration be allowed to continue to the extent possible. The policy also sets standards for how NPS makes informed management decisions in the places where human activities or structures have altered the nature or rate of natural shoreline processes, including for the protection of cultural resources, high density visitor use, and new development.

At the time of the writing of this Draft GMP/EIS, a recent infusion of funding as a result of Superstorm Sandy is supporting research that will provide new information about various aspects of natural coastal processes at Assateague Island. This information will be of use in developing the breach management plan. New science is showing that breaches have widespread and varying effects on coastal geomorphology, adjacent communities, and barrier island management. Work includes a study of the dynamics of the Chincoteague Inlet, an estuarine model for saltmarsh vulnerability that will model future breach locations and response of wetlands to breaches, benthic habitat mapping that could show where overwash and other natural coastal processes might be more likely to occur, and development of a living shoreline that would protect areas of the Chincoteague National Wildlife Refuge. In addition, the National Weather Service (NWS) is now surveying the beach and dunes to ascertain how the dune structure will hold up during high surf events. As part of the survey, the NWS will take multiple measurements of dune heights and beach distances and then use modeling to estimate whether the dunes are likely to be facing erosion or over-topping. This information will help planners develop protocols for assessing when a breach should be allowed to evolve naturally.

### 2.4.3 VISITOR USE AND EXPERIENCE (COMMON TO ACTION ALTERNATIVES 2, 3, AND 4)

Existing interpretive, educational, and management programs providing a range of services to visitors would continue although the interpretive and educational focus would vary in alternatives 2, 3, and 4. The two visitor centers would continue to provide orientation, information, interpretive programs and exhibits, and serve as both destinations and points of departure for day visitors, bus tours, school groups, and campers. Traditional ranger-led activities and curriculum-based educational programs would continue to be available. Programs would emphasize the interpretive themes in the seashore's new long-range interpretive plan.

- **Maryland Developed Area (Development Zone)**

Recreational uses and activities in the Maryland Developed Area would be maintained in all alternatives. However, over time the facilities and infrastructure supporting those uses

would change as natural coastal processes and/or the effects of climate change/sea level rise continue to re-shape the island and damage facilities. How facilities and infrastructure that support recreation uses and activities evolve would vary depending upon the coastal response management framework in alternatives 2, 3, and 4.

Until such time as facilities are lost or damaged, in alternatives 2, 3, and 4 NPS would expand the types and number of commercial services supporting visitor use within the developed area.

- **North End and Backcountry Areas (Natural Resource Zone)**

Day-use on the north end of the island would continue, although how access is managed and the availability of visitor facilities and services would vary in alternatives 2, 3, and 4. The seashore's public hunting program would continue to be managed for its recreation values and as a resource management tool to control non-native sika deer; monitoring would be enhanced to better manage recreational hunting. NPS would continue to develop an annual or biannual hunting plan. Access for hunting could become more difficult due to the effects of climate change/sea level rise.

- **Oversand Vehicle (OSV) Use Area**

Opportunities for driving on the beach (and associated recreation activities) in Maryland would continue, although the areas within which OSVs are permitted would vary in alternatives 2, 3, and 4.

OSV use in Virginia would be as determined by the FWS. FWS proposes to develop a new ½ mile OSV zone to facilitate priority wildlife-dependent uses south of the new recreational beach from March 15 through September 15. FWS would continue current management of the Overwash and Hook area for shorebirds until the new recreational beach is established, at which time the March 15 through September 15 closure would go into effect. OSV access from September 16 to March 14 annually would continue via Beach Road. NPS would cooperate with FWS to provide OSV access.

The NPS would also periodically review regulations pertaining to OSV use at the seashore (36 CFR§7.65(b)) and make amendments if conditions render changes necessary.

- **Virginia Developed Area**

The NPS would continue to support beach-oriented recreational uses in the island developed area within Chincoteague National Wildlife Refuge in Virginia. NPS would continue to manage the recreational beach in accordance with the memorandum of understanding between the NPS and the FWS (see appendix B). The Final CCP/EIS's preferred alternative supports continuation of the recreational beach with 961 automobile parking spaces to be managed by the NPS (US FWS 2015, page 2-51). The Final CCP/EIS's preferred alternative finds that, "In recognition of the vulnerability of the current parking,

the refuge would develop and implement a site design plan for parking and access to a new beach location, approximately 1.5 miles north of the existing beach...The new recreational beach would offer accessible parking in close proximity to the beach." (US FWS 2015, page 2-51)

The Final CCP/EIS's preferred alternative proposes that the transition to the new recreational beach location would occur within eight years or sooner if funding were available (US FWS 2015, page 2-69). In the meantime, NPS would maintain beach recreation and parking at the current location, so long as the land base is available to support this use. Facilities and infrastructure supporting recreation include access roads and parking lots, shade shelters, rest rooms, changing rooms, rinse off showers, and interpretive programs. Until the beach moves, NPS would maintain the Toms Cove Visitor Center. When the beach location is moved northward, a new joint NPS and FWS visitor contact station would be developed. (US FWS 2015, page 2-51). After the new joint visitor contact stations is opened, NPS and FWS may continue to operate environmental education programs from the Toms Cove Visitor Center, as long as that center remains serviceable and can be maintained economically. Eventually the current Toms Cove Visitor Center will be removed when it is no longer possible to maintain it in the face of sea level rise.

NPS would work with the FWS, the town of Chincoteague, Accomack County and others to design the new recreational beach sensitively, to respond to both the natural environment and the needs of the area's visitors. The beach experience, while different from that at the current location, would be designed to engage visitors and provide the kind of recreational opportunity for which the region has justifiably become famous. Careful attention to the design of parking for cars, RVs and buses, boardwalks, accessibility, changing stalls, rinse-off facilities, vault toilets, shelter areas, and other related needs would ensure a quality experience at the new beach location. The Final CCP/EIS's preferred alternative also proposes the management of biting insects to help ensure a positive visitor experience. (US FWS 2015, page 2-70). Critical to the success of the new design will be finding an appropriate balance between visitor experience and resiliency from future storms.

The relocation of the recreational beach might change the availability and mix of interpretive opportunities provided by NPS. NPS would work with FWS in the new joint visitor facility to provide appropriate and meaningful interpretive activities for visitors that take full advantage of the new location and the new preferred alternatives for Beach Road Terminus and Toms Cove Bay.

### 2.4.4 VISITOR FACILITIES AND INFRASTRUCTURE (COMMON TO ACTION ALTERNATIVES 2, 3, AND 4)

Over time, visitor facilities and infrastructure at the seashore would evolve in design, largely in response to natural coastal processes and/or the effects of climate change/sea

level rise. How facilities and infrastructure evolve would vary depending upon the coastal response management framework in alternatives 2, 3, and 4. Any proposed new visitor facilities development, rehabilitation, or post-storm reconstruction would be undertaken only after appropriate climate change and sea level rise risk assessments have been completed.

- **Maryland Mainland Developed Area (Developed Zone)**

Rehabilitation of the previous visitor center for the seashore's environmental education facility would be completed, although the nature of the rehabilitation would vary in alternatives 2, 3, and 4.

A plan would be developed for non-structural stabilization of the mainland shoreline near the visitor center. Actions would be implemented as needed depending upon evolving shoreline conditions.

Within the Maryland Mainland Developed Area, land would be acquired to accommodate an expanded visitor shuttle (see following section).

- **Maryland Access and Transportation**

**Transportation System Management.** The NPS and MD DNR would explore the potential for a consolidated, jointly operated entrance station to Assateague Island located on the mainland in order to gain efficiencies, better manage the number of vehicles accessing the island, achieve shared resource and visitor use management objectives, and facilitate operation of a shuttle system.

Existing automobile-based access to the seashore would be maintained as long as it remains sustainable in the context of natural coastal processes and/or the effects of climate change/sea level rise. On peak days – once parking capacity is reached – the Maryland seashore would be closed to additional vehicles. For visitors still wanting to get to the seashore, a mainland-based commercial shuttle would be available. Visitors would park at the visitor center on the mainland and ride the shuttle to the beach and other attractions on the island. Over time as parking capacity on the island is reduced as a result of natural coastal processes and/or the effects of climate change/sea level rise, shuttle facilities on the mainland would be expanded to support a larger shuttle operation providing additional parking to meet growing demand and offering more frequent service with more shuttle vehicles.

### 2.4.5 NATURAL RESOURCE MANAGEMENT (COMMON TO ACTION ALTERNATIVES 2, 3, AND 4)

In alternatives 2, 3, and 4, seashore management strategies would seek to achieve desired natural resource conditions in the seashore's six management zones as summarized in

table 2.4. As in alternative 1, existing natural resource related practices and programs would initially continue with activities largely directed towards the following:

- protecting sensitive species (e.g. predator control and closures to protect rare, state-listed, and federally-listed threatened and endangered species)
- monitoring resource conditions (e.g. water and air quality, island dynamics, weather)
- mitigating external threats (e.g. water pollution, Ocean City Inlet jetties)
- controlling non-native species (sika deer, invasive plants including *Phragmites*)
- restoring habitats impacted by historic land use (e.g. mosquito ditches, former roads, water impoundments, and former hunting camps and private residences determined not eligible for the National Register)

Over time natural resource protection programs would diminish or expand in alternatives 2, 3, or 4.

In alternatives 2, 3, and 4, the NPS would also continue to partner with the USACE to implement the North End Restoration Project that mitigates the continuing effects of the Ocean City Inlet and jetties by restoring/maintaining sand supply to northern Assateague Island at the historic, pre-Ocean City inlet rate.

In alternatives 2, 3, and 4, NPS would also work cooperatively with the state of Virginia and Accomack County to ensure compliance with applicable natural resource conservation and wastewater treatment regulations at privately owned structures (oyster watch houses) located in the seashore's Virginia waters.

- **Horse Management**

As in alternative 1, the NPS would continue to manage the horse population in Maryland as recommended in the *Environmental Assessment of Alternatives for Managing the Feral Horses of Assateague Island National Seashore* (NPS 2008a), including use of contraceptives to achieve and maintain a stable population of 80 to 100 horses. Emphasis would be placed on education and enforcement actions to minimize adverse interactions between horses and visitors.

- **Marine Resource Management**

NPS would collaborate with the states of Maryland and Virginia and local communities to protect a unique working marine landscape and way of life and to protect seashore resources. The following recommendations are consistent with current NPS policy, expand opportunities to research and understand natural resource conditions and the cultural heritage associated with the seashore's marine environment, and open up avenues for constructive conversation about these management activities going forward.

**Working Collaboratively to better Understand Natural and Cultural Resources.** NPS would work with local communities, Accomack and Worcester Counties, local watermen,

the states of Virginia and Maryland, and Chincoteague National Wildlife Refuge to understand and document the history and tradition of watermen in the Chincoteague/Sinepuxent Bay region. Studies would include surveying traditional knowledge within eastern shore communities and evaluating the maritime cultural landscape. In addition, NPS would work collaboratively with these groups to understand the status of the seashore's marine resources, and the best ways to ensure their continued resilience and productivity.

**Resource Management Actions for Shellfishing.** In accordance with the seashore's authorizing legislation, the states of Virginia and Maryland would continue to manage shellfishing within the seashore.

**Resource Management Actions for Commercial Aquaculture.** Commercial aquaculture began in the 1850s in Virginia waters in and near Assateague. The commonwealth of Virginia has leased land for clam and oyster aquaculture within what became seashore waters since the 1890s. In recognition of this long history of use, NPS would issue a special use permit under 36 CFR 2.60(3)b to the Virginia Marine Resource Commission (VMRC) within the commonwealth of Virginia to allow for the continued practice of commercial aquaculture and maintenance of the historic setting. The VMRC holds the commercial aquaculture leases and has regulatory oversight over the activity. The VRMC would continue to be responsible for managing the leases and ensuring that commercial aquaculture within seashore waters is consistent with the special use permit. Aquaculture does not have the long history in Maryland, and the state of Maryland prohibits aquaculture within seashore waters.

**Resource Management Actions for Horseshoe Crab Harvest**. NPS would prohibit the harvest of horseshoe crabs as proposed in the recently completed *Chincoteague and Wallops Island National Wildlife Refuges Final Comprehensive Conservation Plan (CCP/EIS) and Environmental Impact Statement* (US FWS 2015).

**Integrating Cultural Heritage into Interpretive Programming**. NPS would collaborate with local and regional cultural and academic institutions to develop interpretive programming and other visitor information that would illuminate the cultural heritage of the eastern shore as it pertains to Assateague Island and its surrounding waters.

- **Wilderness Management**

As ongoing and future actions by the NPS are completed, the acreage of wilderness lands meeting the desired conditions should increase substantially. Recommended management actions to be implemented through the GMP to further protect and enhance wilderness qualities would generally include the following:

- Undertake an assessment of eligibility and prepare a new wilderness study that addresses the following:

  - review the wilderness boundary in the context of new assessment of acreage, climate change, sea level rise and erosion, as well as specific shoreline management activities (e.g., breach management)
  - amend the existing wilderness boundary to address what are presently non-conforming uses such as the OSV corridor and access areas that are required for administrative use ("cherry stems")
  - consider new access corridors that may be necessary to accommodate new, water-based public access
- Generally manage potential and recommended wilderness to preserve, restore, and enhance natural ecological conditions and wilderness qualities while providing limited opportunities for low density, low impact primitive recreation experiences.
- Implement a long-term monitoring program to assess the conditions and trend of wilderness character over time based on the "keeping it wild" framework, adapted for the individual characteristics of the Assateague Island Wilderness.

### 2.4.6 CULTURAL RESOURCE MANAGEMENT (COMMON TO ACTION ALTERNATIVES 2, 3, AND 4)

In alternatives 2, 3, and 4, seashore management strategies would seek to achieve desired conditions in the cultural resource management zone as summarized in table 2.4. Cultural resource management zones would include the sites of the former Assateague Beach U.S. Coast Guard Station and former Green Run Lodge. While these zones would remain the same in alternatives 2, 3, and 4, the specific management actions in cultural resource zones would differ as a function of the overall alternative concept.

### 2.4.7 SEASHORE OPERATIONS (COMMON TO ACTION ALTERNATIVES 2, 3, AND 4)

The scope and complexity of seashore operations would change as the island visitor use infrastructure changes as a result of different responses in each alternative to natural coastal processes and/or the effects of climate change/sea level rise. The nature of the change in seashore operations would vary significantly in alternatives 2, 3, and 4.

### 2.4.8 PARTNERSHIPS (COMMON TO ACTION ALTERNATIVES 2, 3, AND 4)

Existing partnerships and cooperative relationships that support ongoing management programs and activities would continue, although over time the emphasis on some partners and the evolution of new partnerships would vary in alternatives 2, 3, and 4.

As in alternative 1, key partners would be Chincoteague National Wildlife Refuge and Assateague State Park. The relationship with the refuge would continue to be governed by Service First Authority existing and future memoranda of agreement, and include cooperation in the provision of visitor services, interpretive services, visitor and resource protection, and facility management in the assigned area within the refuge. The NPS would continue to work with MD DNR to cooperatively manage shared issues of concern.

As in alternative 1, the USACE would continue to partner with the NPS to address the chronic sand supply impacts to the north end of Assateague Island from the jetty-stabilized Ocean City Inlet.

As in alternative 1, other important partners would continue to be universities, federal, state and local agencies, and non-governmental entities supporting resource stewardship, research, law enforcement, emergency response, environmental education, community involvement, and seashore operations. However, the focus of these relationships and their relative importance would vary in alternatives 2, 3, and 4.

### 2.4.9 LAND ACQUISITION (COMMON TO ACTION ALTERNATIVES 2, 3, AND 4)

In alternatives 2, 3 and 4, NPS would seek to acquire additional land on the mainland in the general vicinity of the Maryland headquarters complex to support park operations and/or development of new visitor facilities. The amount of land required and its purpose would vary among the alternatives.

### 2.4.10 SEASHORE BOUNDARY (COMMON TO ACTION ALTERNATIVES 2, 3, AND 4)

As in alternative 1, the NPS would continue to work with the Department of the Interior's Office of the Solicitor to assess options to resolve boundary issues associated with the changing location of the island's shoreline.

As in alternative 1, in order to clarify federal land management responsibilities on Assateague Island, the NPS would assume full management responsibility for those lands within the seashore boundary in Maryland originally purchased with FWS appropriated funds (approximately 418 acres). Conversely, the FWS would assume full management responsibility for those lands within the seashore boundary in Virginia (except for the former Assateague Beach U.S. Coast Guard Station property) originally purchased with NPS appropriated funds (approximately 400 acres).

### 2.4.11 EXAMPLES OF ACTIONS NEEDED TO ACHIEVE DESIRED FUTURE CONDITIONS (COMMON TO ACTION ALTERNATIVES 2, 3, AND 4)

Table 2.5 identifies some of the actions needed to move from existing conditions to desired conditions that are common to action alternatives 2, 3, and 4. In addition to these actions, planned and programmed actions identified in alternative 1 would be common to alternatives 2, 3, and 4 (table 2.2).

### 2.4.12 COSTS

The NPS has prepared estimates of the annual operating costs and one-time costs associated with each action alternative. Costs associated with actions common to alternatives 2, 3, and 4 are included in the total costs for each alternative as summarized below in sections 2.5.11, 2.6.11, 2.7.11, and 2.10, and table 2.11.

**Table 2.5 Alternatives 2, 3, and 4 – Examples of Actions Needed to Achieve Desired Future Conditions (common to the action alternatives)[1]**

| | | Examples of the Types of Actions Needed |
|---|---|---|
| **Seashore Wide** | **Community Resilience** | ▪ work cooperatively with other federal agencies, the states, counties, and communities to explore how best to model the impacts of sea level rise and storm surge<br>▪ explore ways to mitigate hazards and increase the resiliency of surrounding communities and infrastructure |
| | **Other Special Studies** | ▪ develop a breach management plan to guide management responses to future breaches on the island |
| **Development Zone** | **Maryland Island Developed Area** | ▪ remove existing entrance station and restore site<br>▪ implement an alternative transportation system – develop shelters and pull-offs at two sites on the island to support a mainland-based commercial shuttle (to be used once parking capacity on the island is reached)<br>▪ develop a plan/EA for commercial services for concessions; as recommended in the plan, expand the types and number of commercial services supporting visitor use |
| | **Maryland Mainland Developed Area** | ▪ develop a consolidated, jointly operated entrance station (with MD DNR), including widening of MD Route 611 in the entrance station vicinity<br>▪ implement an alternative transportation system – develop facilities to support a mainland-based commercial vehicular shuttle<br>▪ develop a plan for non-structural stabilization of the mainland shoreline in the vicinity of the new visitor center; implement the plan as needed depending on evolving shoreline conditions |
| | **Virginia Assigned Area Subzone** | ▪ cooperate with the FWS according to the memorandum of understanding to provide high quality recreation, interpretive, and educational opportunities for the visiting public |
| **Natural Resource Zone** | **Resource Preservation Subzone** | • undertake an assessment of eligibility and prepare a new wilderness study<br>▪ generally manage recommended and potential wilderness to preserve, restore, and enhance natural ecological conditions and wilderness qualities while providing limited opportunities for low density, low impact primitive recreation experiences<br>▪ implement a long-term monitoring program to assess the conditions and trend of wilderness character over time based on the "keeping it wild" framework, adapted for the individual characteristics of the Assateague Island Wilderness |
| **Chincoteague Bay, Sinepuxent Bay and Atlantic Ocean** | **Primary Zones** | ▪ work with local communities, Accomack and Worcester Counties, local watermen, the states of Virginia and Maryland, and Chincoteague National Wildlife Refuge to understand and document the history and tradition of watermen in the Chincoteague/Sinepuxent Bay region. Studies would include surveying traditional knowledge within eastern shore communities and evaluating the maritime cultural landscape<br>▪ work collaboratively with local communities, Accomack and Worcester Counties, local watermen, the states of Virginia and Maryland, and Chincoteague National Wildlife Refuge to understand the status of marine resources of the seashore, and the best ways to ensure their continued resilience and productivity<br>▪ work with Virginia and Accomack County to ensure appropriate wastewater treatment and disposal at private structures (e.g. oyster watch houses)<br>▪ continue to implement the North End Restoration Project to mitigate environmental impacts of the Ocean City Inlet jetties and the Ocean City Inlet (with USACE) |

[1] *Actions common to the action alternatives also include planned and programmed actions included in alternative 1 (see table 2.2).*

## 2.5 Alternative 2 – Concentrated Traditional Beach Recreation

### 2.5.1 OVERALL CONCEPT

Most visitors to the seashore would enjoy traditional beach recreation concentrated within a high density island developed area in Maryland accessible by private vehicle. Artificial dune fortification, habitat manipulations, and possibly beach nourishment would protect the island developed area from the natural coastal processes and/or the effects of climate change/sea level rise as long as a suitable land base exists and funding is available. Over time, the island developed area would likely be consolidated in response to the increasing challenge of protecting facilities from sea level rise and greater storm intensity. Increased crowding could lead to visitor use limits. Increased fees could be needed to offset the higher cost of providing visitor facilities. Breach management protocols would generally seek to repair storm overwash and breaches in the island developed area in Maryland, and to let the island's backcountry areas evolve naturally – without interference – subject to the full effects of natural coastal processes and/or climate change/sea level rise.

In Virginia, the NPS would continue to support beach-oriented recreation uses in the island developed area within Chincoteague National Wildlife Refuge (see actions common to alternatives 2, 3 and 4 – Visitor Use and Visitor Experience in Virginia).

### 2.5.2 VISITOR USE AND EXPERIENCE (ALTERNATIVE 2)

The seashore's two visitor centers would continue to provide orientation, information, interpretive programs, and exhibits and would serve as both destination and departure points for day visitors, bus tours, school groups, and campers. While the services provided at the visitor centers would remain largely unchanged, programming would likely become more heavily focused on orientation, information, and safety. Interpretive and environmental education programming would be based on the interpretive themes but would increasingly focus on recreation, orientation, information, and safety; resource-based issues, including climate change/sea level rise, would receive minimal emphasis. Curriculum-based environmental education programs would continue but could decrease in scope as resources are gradually re-directed towards the traditional summer visitor. The seashore would continue efforts to engage underrepresented communities, although the scope of activities would be unlikely to increase. Web-based and other non-personal services would likely increase as the preferred medium for providing information. The use of social media would also likely increase as a means to provide quick delivery of information.

Within the island developed area in Maryland, development would emphasize traditional automobile-based access and recreation. Beach parking, RV camping, and other improvements would continue to be accessible via private vehicle. Existing infrastructure would be upgraded to improve visitor amenities, such as hot water showers and more

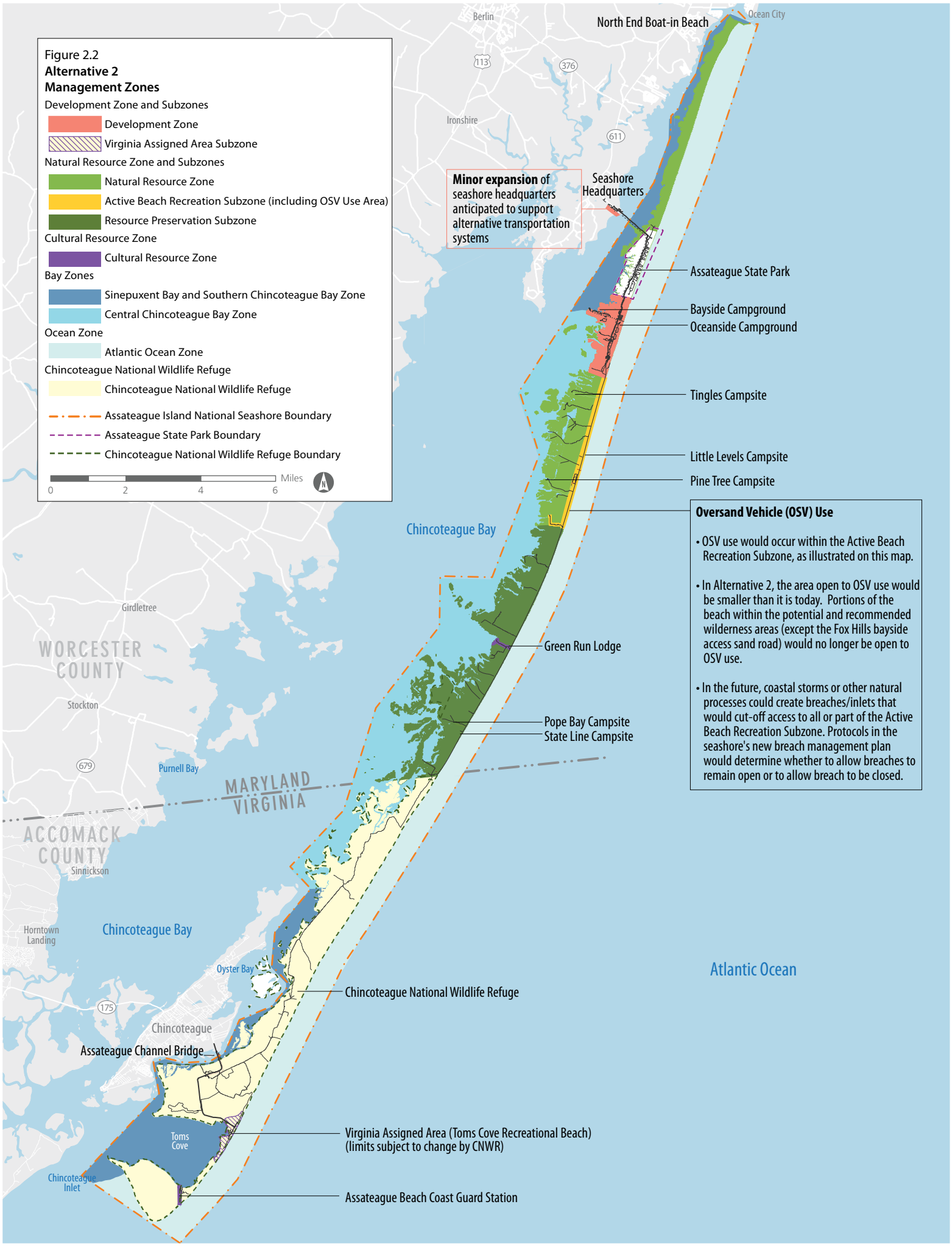
Figure 2.2
Alternative 2
Management Zones
Development Zone and Subzones
Development Zone
Virginia Assigned Area Subzone
Natural Resource Zone and Subzones
Natural Resource Zone
Active Beach Recreation Subzone (including OSV Use Area)
Resource Preservation Subzone
Cultural Resource Zone
Cultural Resource Zone
Bay Zones
Sinepuxent Bay and Southern Chincoteague Bay Zone
Central Chincoteague Bay Zone
Ocean Zone
Atlantic Ocean Zone
Chincoteague National Wildlife Refuge
Chincoteague National Wildlife Refuge
Assateague Island National Seashore Boundary
Assateague State Park Boundary
Chincoteague National Wildlife Refuge Boundary
0
2
4
6
Miles
Berlin
Ocean City
North End Boat-in Beach
113
376
Ironshire
611
Minor expansion of seashore headquarters anticipated to support alternative transportation systems
Seashore Headquarters
Assateague State Park
Bayside Campground
Oceanside Campground
Tingles Campsite
Little Levels Campsite
Pine Tree Campsite
Oversand Vehicle (OSV) Use
• OSV use would occur within the Active Beach Recreation Subzone, as illustrated on this map.
• In Alternative 2, the area open to OSV use would be smaller than it is today. Portions of the beach within the potential and recommended wilderness areas (except the Fox Hills bayside access sand road) would no longer be open to OSV use.
• In the future, coastal storms or other natural processes could create breaches/inlets that would cut-off access to all or part of the Active Beach Recreation Subzone. Protocols in the seashore's new breach management plan would determine whether to allow breaches to remain open or to allow breach to be closed.
Chincoteague Bay
Girdletree
WORCESTER COUNTY
Green Run Lodge
Stockton
Pope Bay Campsite
State Line Campsite
679
Purnell Bay
MARYLAND
VIRGINIA
ACCOMACK COUNTY
Sinnickson
Horntown Landing
Chincoteague Bay
Atlantic Ocean
Oyster Bay
Chincoteague National Wildlife Refuge
175
Chincoteague
Assateague Channel Bridge
Toms Cove
Virginia Assigned Area (Toms Cove Recreational Beach)
(limits subject to change by CNWR)
Chincoteague Inlet
Assateague Beach Coast Guard Station

utilities at developed campsites. Over time visitor facilities and infrastructure such as developed campgrounds, beach parking, restrooms, and changing areas would be concentrated within a smaller developed area and fortified to withstand natural coastal processes and/or the effects of climate change/sea level rise. New facilities could be developed to enhance recreation opportunities, such as a campground store or restaurant. A combined ranger station/campground office and small maintenance yard would remain on the island.

The risk to continued visitor use and enjoyment of the seashore would be high. Should fortification of the island developed area ultimately prove impracticable and/or should funding not be available to repair damaged or lost facilities, the seashore could become inaccessible to visitors for months to years following major storm events.

- **Maryland Island Developed Area (Development Zone)**

Traditional recreation uses and activities in the island developed area would be maintained as long as feasible (e.g. a suitable land base exists and funding is available). Management actions would emphasize recreation opportunities similar to those currently offered. As the island changes over time, the size of the island developed area would likely contract, resulting in the need to establish visitor use limits and/or accept a diminished quality of experience due to overcrowding. As the island's developed zone contracts, the increased density of users could result in a shift away from organized interpretive programs towards more informal roving interpretive activities. Those remaining programs would likely focus more heavily on recreation use and safety.

Expanded commercial services (e.g. food providers, convenience equipment rentals), additional lifeguards, and campground facilities with more amenities would enhance the visitor experience.

- **North End and Backcountry Areas (Natural Resource Zone)**

Existing recreation uses of the seashore's backcountry and adjacent waters would continue as long as access remains possible. Opportunities for primitive camping would continue, but with little or no additional investment. High density visitor use in the north end of the island would not be allowed due to the associated impacts and the anticipated lack of resources needed to mitigate the effects of high density visitor use outside the development zone (such as a vessel with a restroom).

- **Oversand Vehicle Use Area (Active Beach Subzone)**

As long as access exists, opportunities for driving on the beach (and associated recreation activities) in Maryland would continue but within a smaller designated OSV use area limited to the area outside of the potential and recommended wilderness (south of the island developed area to approximately KM 23.4). If vehicular access to the OSV use area is lost due to natural coastal processes or the effects of climate change/sea level rise (e.g.

a persistent breach occurs in the OSV use area and the breach management plan calls for it to stay open), no action would be taken to restore it and access could be further reduced or eliminated.

- **Virginia Developed Area (Virginia Assigned Area Subzone)**

The NPS would continue to support beach-oriented recreation uses in the assigned area in Virginia within Chincoteague National Wildlife Refuge. Management actions would be common to alternatives 2, 3 and 4 as described above in section 2.4.3.

### 2.5.3 VISITOR FACILITIES AND INFRASTRUCTURE (ALTERNATIVE 2)

Existing visitor facilities and infrastructure would be maintained on the island as long as a suitable land base exists and funding is available. New visitor facilities development, rehabilitation, or post-storm reconstruction would be undertaken only after appropriate climate change and sea level rise risk assessments have been completed.

- **Maryland Mainland Developed Area (Development Zone)**

Existing mainland visitor use facilities (visitor center and environmental education center) would remain at their current locations. Rehabilitation of the old visitor center as the seashore's environmental education center would be completed. Maryland operational facilities (administrative and maintenance) would be rehabilitated.

- **Maryland Access and Transportation**

**Response to Storm Damage and Contingency Planning.** Traditional automobile access to the seashore would be supported as long the bridges and roadways remain useable. There would be no contingency planning or advance action to address the potential loss of road and/or bridge access. Damage to seashore roads from natural coastal processes and/or the effects of climate change/sea level rise would be repaired as long as suitable land base exists and funding is available. Should the Verrazano Bridge be damaged or fail, the NPS would encourage the state of Maryland to make repairs. Should the Virginia access bridges be damaged or fail, the NPS would seek funding to make repairs.

As the island developed area contracts over time, vehicle parking capacity would decrease, forcing more visitors to more frequently use the mainland-based shuttle.

### 2.5.4 NATURAL RESOURCE MANAGEMENT (ALTERNATIVE 2)

Over time the scope of existing resource management programs and activities would likely diminish. As the costs associated with protecting the visitor use areas within the island developed area escalate, some of the resources supporting the seashore's resource management programs would likely be re-directed towards activities protecting recreation opportunities. Some programs such as efforts to mitigate historic land use impacts would likely be abandoned in order to continue addressing other higher priority needs. Other resource programs would probably experience a gradual decrease in scope

and/or frequency of activities, such as less frequent monitoring and treatment of fewer acres of land infested with invasive species. A benefit of the changes in the patterns, locations, and intensity of visitor use (e.g. a smaller OSV use area, reduced visitor use at the north end, more concentrated use in the island developed areas) would be a potential decrease in the complexity of some resource management issues because of reduced conflicts between visitor use and sensitive resources.

Cooperative research activities would continue, but the ability of the NPS to encourage and support those activities would also likely decline. The result would be less information available to promote understanding and protection of resources and to support management decision-making. With limited or shrinking capabilities, the NPS would struggle to address the challenges of climate change/sea level rise. Other emerging threats would also be less likely to be detected and successfully addressed.

- **Potential and Recommended Wilderness Area (Resource Protection Subzone)**

As in alternative 1, the potential and recommended Assateague wilderness would continue to be managed to protect and enhance the character of the area through actions to eliminate incompatible features and activities. There would be no change in the size or location of the potential and recommended wilderness.

### 2.5.5 CULTURAL RESOURCE MANAGEMENT (ALTERNATIVE 2)

- **Assateague Beach U.S. Coast Guard Station (Cultural Resource Zone)**

The former Assateague Beach U.S. Coast Guard Station would not be maintained. No actions would be taken to protect the structures and cultural landscape from natural coastal processes and/or the effects of climate change/sea level rise. If it is determined that the historic structures and cultural landscape have become so damaged by coastal storms, sea level rise, or other climate change related issues that they create a hazard, NPS would document the resources in accordance with the *Secretary of the Interior's Standards* (NPS 1995c) and other NPS policies, guidelines, and standards. Then NPS would likely demolish the structures and rehabilitate the sites to foster a return to natural conditions.

- **Green Run Lodge**

Green Run Lodge would remain vacant. The NPS would not maintain or stabilize the structure. The lodge would be documented in accordance with the *Secretary of the Interior's Standards* (NPS 1995c) and other NPS policies, guidelines, and standards. If it is determined that the historic structures and cultural landscape have become so damaged by coastal storms, sea level rise, or other climate change related issues that they create a hazard, NPS would document the resources in accordance with the *Secretary of the Interior's Standards* (NPS 1995c) and other NPS policies, guidelines, and standards. Then

NPS would likely demolish the structures and rehabilitate the sites to foster a return to natural conditions.

### 2.5.6 SEASHORE OPERATIONS (ALTERNATIVE 2)

The scope and complexity of seashore operations would change as visitor use and recreation infrastructure are consolidated within a smaller developed area. Additional changes would occur if automobile access to the island is lost due to natural coastal processes or the effects of climate change/sea level rise.

- **Visitor Use Management.** The primary focus of visitor use management activities would remain in the island developed area and OSV use area. As the island developed area contracts in size and parking becomes limited, activities would expand to include mainland shuttle staging areas. A more intense focus on island developed area recreation would likely require additional visitor use management capacity (e.g. expanded lifeguard and visitor and resource protection services). The smaller size of the OSV use area should reduce visitor use management needs although the capacity would likely remain unchanged. Should a persistent breach occur that further limits or eliminates access, and the breach management plan recommends that it remain open, OSV use and the scope of required management activities would be further reduced. Restricted OSV access for administrative purposes would likely require that some management activities become water-based.
- **Facility Management.** The scope and complexity of facility management on the island would likely increase as new visitor amenities are introduced to the island developed area, and when an overflow shuttle system is implemented. Each would involve new structures and infrastructure requiring maintenance and upkeep. The extent of facility management needs would also increase as natural coastal processes and/or the effects of climate change/sea level rise impact the island developed area. Over time, protection actions (e.g. dune building, beach replenishment) would become increasingly complex and challenging.
- **Resource Protection and Management**. In the event of a persistent breach or other events that limit automobile access, the complexity of resource protection/management functions would significantly increase owing to the logistical difficulties of water-based access. The reduction in the size of the OSV use area would limit traditional access for public deer and sika hunting; seashore managers would explore options and take actions to manage herd sizes, as appropriate, to meet deer management objectives. Should traditional automobile access to all or parts of the island be lost, the complexity of conducting field-based resource management and research would increase with the required shift to water-based modes of transportation.
- **Commercial Services Management.** As new commercial services are introduced in the developed area, NPS staff would spend more time

administering contracts and supporting the needs of a larger number and more diverse set of commercial service providers in an increasingly congested area.

- **Fee Structure and Revenue.** Recreational fees would likely increase as a result of the enhanced amenities being provided (e.g. campground utilities, more lifeguards), and the additional costs borne by the NPS in protecting and maintaining traditional access and facilities in the face of island dynamics. Other costs to the visitor could include commercial service fees for accessing the seashore by shuttle when parking capacity is reached. Revenue to the NPS would increase, although it is unlikely to fully offset the increased costs of fortifying and protecting the island developed area. If OSV access is lost due to changing environmental conditions, revenue coming into the seashore would likely decline substantially.
- **Staffing.** Staffing levels would increase (4.5 additional full-time equivalent employees) and the types of staff would likely shift towards those most directly involved in visitor use management (e.g. lifeguards, resource and visitor protection, maintenance) as visitor use opportunities are enhanced and consolidated in a smaller island developed area.
- **Administration.** Administrative functions and needs would likely remain relatively constant except that new expertise could be needed to manage the expanded range of commercial services being provided.

### 2.5.7 PARTNERSHIPS (ALTERNATIVE 2)

Existing partnerships and cooperative relationships that support seashore management would continue. As actions to fortify and protect the island developed area become more complex, the NPS would expand its existing partnership with the USACE related to erosion control. Partnerships with tourism and recreation interests would likely expand, particularly those with new commercial service providers active in the island developed area.

### 2.5.8 LAND ACQUISITION (ALTERNATIVE 2)

The NPS would seek to acquire approximately 10 acres in the general vicinity of the Maryland headquarters complex to support development of the alternative transportation shuttle system.

### 2.5.9 SEASHORE BOUNDARY (ALTERNATIVE 2)

NPS would seek an increase in the seashore's authorized ceiling for acquiring interests in land (fee simple and easements) on the mainland in Worcester County, Maryland, for purposes of addressing operational and management issues. This would enable acquisition of up to 10 acres for development of facilities to support the new alternative transportation system.

### 2.5.10 EXAMPLES OF ACTIONS NEEDED TO ACHIEVE DESIRED FUTURE CONDITIONS (ALTERNATIVE 2)

Table 2.6 identifies some of the actions needed to move from existing conditions to desired conditions in alternative 2.

### 2.5.11 COSTS (ALTERNATIVE 2)

The NPS has prepared estimates of annual operating costs and one-time costs associated with alternative 2 using NPS and industry cost estimating guidelines (see table 2.11 in section 2.10). Annual recurring costs include personnel and non-labor costs, such as utilities, vehicles, travel, and supplies. One-time capital investments include construction, exhibits, research and planning. These costs are presented for comparative purposes only and would be refined at a later date based upon final design of facilities and other considerations. Some projects have the potential to be funded through partnerships and volunteers, or through shared funding with other agencies. Therefore, actual costs would vary depending on when specific actions are implemented and on contributions by partners and volunteers.

- **NPS Annual Operating Costs and Staffing Requirements**

NPS annual operating costs associated with alternative 2 are estimated to be $6,058,000 (2013 dollars). This includes the anticipated cost for staff salaries and benefits for 45.5 full-time equivalent (FTE) staff, utilities, supplies, services, and other materials needed for seashore maintenance and operations. The FTE number indicates funded NPS staff only, and does not include volunteer positions, positions funded by partners, or staff hired by NPS with other funds, such as Federal Land Recreation Enhancement Act fees, 54 U.S.C. 101702 funds (commonly referred to as "living exhibits and interpretive demonstrations" fees), special use permit fees, and commercial use authorization funds.

- **One-Time Costs**

Total one-time costs associated with alternative 2 are estimated to be $71,946,821 (2013 dollars) including one-time facilities costs and non-facilities costs. Land acquisition costs and contingency costs are not included.

The NPS share of these one-time costs is estimated at approximately is $52,979,557 (74% of total one-time costs). Major facilities costs include those for:

- administrative offices rehabilitation
- maintenance facilities rehabilitation
- environmental education center rehabilitation
- land-based alternative transportation system
- beach nourishment
- structures to support expanded commercial use

Major non-facilities costs include those for:

- relic mosquito ditch restoration
- phragmites control

Total one-time partner costs are estimated at approximately $18,967,264 (26% of total one-time costs) (2013 dollars). Major partner costs include those for:

- road and parking area pavement management projects (by FHWA)
- beach nourishment (by USACE)

**Table 2.6 Alternative 2 – Examples of Actions Needed to Achieve Desired Future Conditions**

| | | Examples of the Types of Actions Needed |
|---|---|---|
| **Seashore-Wide Topics** | **Natural Resource Management** | (no actions identified) |
| | **Cultural Resource Management** | (no actions identified) |
| | **Visitor Experience Enhancements** | ▪ expand existing partnerships to maintain existing visitor experiences<br>- with USACE to control beach erosion<br>- with tourism and recreation interests<br>- with commercial service providers |
| | **Other Special Studies** | (no actions identified in addition to those common to alternatives 2, 3, and 4) |
| **Development Zone** | **Maryland Island Developed Area** | ▪ expand the types and number of commercial services supporting visitor use<br>▪ expand utility systems in campgrounds (electricity and water to all sites with hardened pads)<br>▪ expand lifeguard operations and capacity to provide emergency services<br>▪ designate areas for specific recreation activities (surfing, fishing, swimming, beach fires, etc.)<br>▪ expand capacity of maintenance division to protect and maintain developed area<br>▪ retain existing island maintenance yard (bone yard) to support island operations<br>▪ repair/replace facilities in-kind when damaged or become obsolete (consolidation of developed area could become necessary over time) (contingency action)<br>▪ develop non-structural storm protection features to protect facilities and infrastructure (beach dune grass planting, sand fencing (for deposition and to exclude horses))<br>▪ develop a plan for beach nourishment to protect developed area using heavy equipment to maintain dune<br>▪ implement beach nourishment to protect developed area (repeat every five years) (contingency action)<br>▪ periodically move the dune landward to maintain appropriate beach width and to protect the dune (beach dune grass planting, sand fencing (for deposition and to exclude horses), boardwalk reconstruction)<br>▪ repair breaches when necessary (per breach management plan) (contingency action)<br>▪ repair damage to seashore roads (contingency action) when necessary |
| | **Maryland Mainland Developed Area** | ▪ complete rehabilitation of the previous visitor center as an environmental education center<br>▪ acquire additional land base as necessary to support new facilities, including:<br>- 10 acres to support ATS development<br>▪ encourage the state of Maryland to repair Verrazano Bridge and causeway if damaged<br>▪ demolish existing administrative offices and maintenance facilities; rebuild at same site |
| | **Virginia Assigned Area Subzone** | (no actions identified in addition to those common to alternatives 2, 3, and 4) |
| **Natural Resource Zone** | **Primary Zone** | ▪ reduce resource management programs<br>▪ maintain existing backcountry campsites as is with minimal investments<br>▪ continue prohibition on the use of motorized vessels to access backcountry campsites<br>▪ restrict use of the north end boat-in beach to limit resource impacts |
| | **Active Beach Recreation Sub Zone** | ▪ reduce the size of the sub zone to eliminate OSV use within the potential and recommended wilderness area (south of KM 23.4) except for an administrative corridor around the existing Fox Hills public cross island bayside access sand road<br>▪ eliminate the conflict of the OSV use area and wilderness by beginning OSV use area at KM 16 and ending it at KM23; establish an administrative corridor around the existing Fox Hill public cross island bayside access sand road<br>▪ should vehicle access be lost in the remaining sub zone (and the breach management plan recommends that it remain closed), convert inaccessible areas to natural resource zone |
| | **Resource Preservation Sub Zone** | (no actions identified in addition to those common to alternatives 2, 3, and 4) |

**Table 2.6 Alternative 2 – Examples of Actions Needed to Achieve Desired Future Conditions (continued)**

| | | Examples of the Types of Actions Needed |
|---|---|---|
| **Cultural Resource Zone** | **Primary Zone** | ▪ at the former Assateague Beach U.S. Coast Guard Station and former Green Run Lodge:<br>- no actions to maintain resources<br>- no actions to protect resources from natural coastal processes and/or effects of climate change/sea level rise |
| **Central Chincoteague Bay** | **Primary Zone** | (no actions identified in addition to those common to alternatives 2, 3, and 4) |
| **Sinepuxent and Southern Chincoteague Bay** | **Primary Zone** | (no actions identified in addition to those common to alternatives 2, 3, and 4) |
| **Atlantic Ocean** | **Primary Zone** | (no actions identified in addition to those common to alternatives 2, 3, and 4) |

## 2.6 Alternative 3 – Sustainable Recreation and Climate Change Adaptation (NPS Preferred Alternative)

### 2.6.1 OVERALL CONCEPT

Climate change adaptation would play an increasingly important role in seashore management. Over time, natural coastal processes and/or the effects of climate change/sea level rise are expected to become the dominant force shaping the character of the island developed area in Maryland. To minimize or avoid the damaging effects of natural coastal processes and/or climate change/sea level rise, visitor use infrastructure would evolve to more sustainable designs and likely shift to new, more stable locations. Some manipulations of the natural environment would be necessary to sustain recreation opportunities but would be kept to the minimum needed. This would include limited maintenance of the existing artificial dune system as facilities and infrastructure transition to more sustainable designs. Breach management protocols would seek a reasonable balance that would generally let the island evolve naturally subject to the effects of natural coastal processes and/or climate change/sea level rise while taking into consideration needs for human safety and protection of property. Impacts to natural sand transport processes from the jetty-stabilized Ocean City Inlet would continue to be mitigated. Planning and development of alternative transportation systems including shuttles, ferries, and new bayside access along Chincoteague Bay would prepare the seashore for possible loss of traditional land access. Overall, visitors would enjoy expanded opportunities for sustainable recreation throughout the seashore due to additional access points throughout the seashore.

In Virginia, the NPS would continue to support beach-oriented recreation uses in the island developed area within Chincoteague National Wildlife Refuge (see actions common to alternatives 2, 3 and 4 – Visitor Use and Visitor Experience in Virginia).

### 2.6.2 VISITOR USE AND EXPERIENCE (ALTERNATIVE 3) (NPS PREFERRED ALTERNATIVE)

The seashore's two visitor centers would continue to provide orientation and information but would increasingly become centers of learning emphasizing resource stewardship, sustainability, climate change threats and adaptation, and seashore resource management issues. As opportunities for visitor use expand on both the island and mainland, so too would opportunities for visitor services. When implemented, staff would also make use of new points of departure such as ferry terminals and shuttle staging areas to provide orientation, safety messaging, and basic information.

Sustainability messaging would become an essential part of all programs. Recreational programming would begin to emphasize more activities and experiences that promote resource stewardship. The seashore would also begin targeting new and non-traditional users as the types and nature of recreation opportunities evolve. Traditional ranger-led programs and environmental education would be guided by the interpretive themes as

well as the special emphasis issues, and would continue to stress activities and experiences that promote resource stewardship and opportunities for in-depth learning. Opportunities for in-depth learning would be expanded through enhancements to existing educational facilities, and the development of a primitive campground dedicated to immersive environmental education. Outreach to underserved communities would likely increase as all segments of the local community are drawn into discussions and plans related to climate change response. The use of social media and web-based technologies would likely expand, both in the amount of information made available as well as content; increased emphasis would be placed on providing comprehensive information on resource issues, particularly on the threats from and response to climate change/sea level rise.

The risk to continued visitor use at the seashore would be low. Adaptive management and contingency planning would include transitioning to sustainable facilities and infrastructure and development of alternative transportation systems. This would reduce the potential for the seashore to become inaccessible to visitors following major storm events.

- **Maryland Island Developed Area (Development Zone)**

Most recreation uses and activities in the island developed area would be maintained, although over time, the facilities and infrastructure supporting those uses would evolve towards greater sustainability. Initially beach parking, RV camping, and other improvements would continue to be accessible by private vehicle. When existing facilities and infrastructure are damaged by natural coastal processes and/or climate change/sea level rise, decisions regarding the repair and/or replacement of facilities and infrastructure would be based on a cost-benefit analysis of their sustainability in the face of natural coastal processes and/or climate change/sea level rise. When no longer sustainable on the island, some facilities and infrastructure, such as parking and RV camping, would move to the mainland.

Lost opportunities would be replaced with similar but less infrastructure dependent activities. The NPS would collaborate with MD DNR to explore opportunities for replacing lost recreation uses with similar uses on the mainland. Visitor services would increasingly focus on promoting resource stewardship, both within and outside the seashore. Commercial providers would continue to offer appropriate visitor services (e.g. canoe rentals, convenience store) with some potential for minor enhancements or new services (e.g. eco tours in both the developed and undeveloped areas of the seashore).

- **North End and Backcountry Areas (Natural Resource Zone)**

Recreational use of the backcountry would be enhanced through development of one to three new bayside access points for both motorized and non-motorized vessels, strategically located along the length of the seashore. At least one of these sites could be

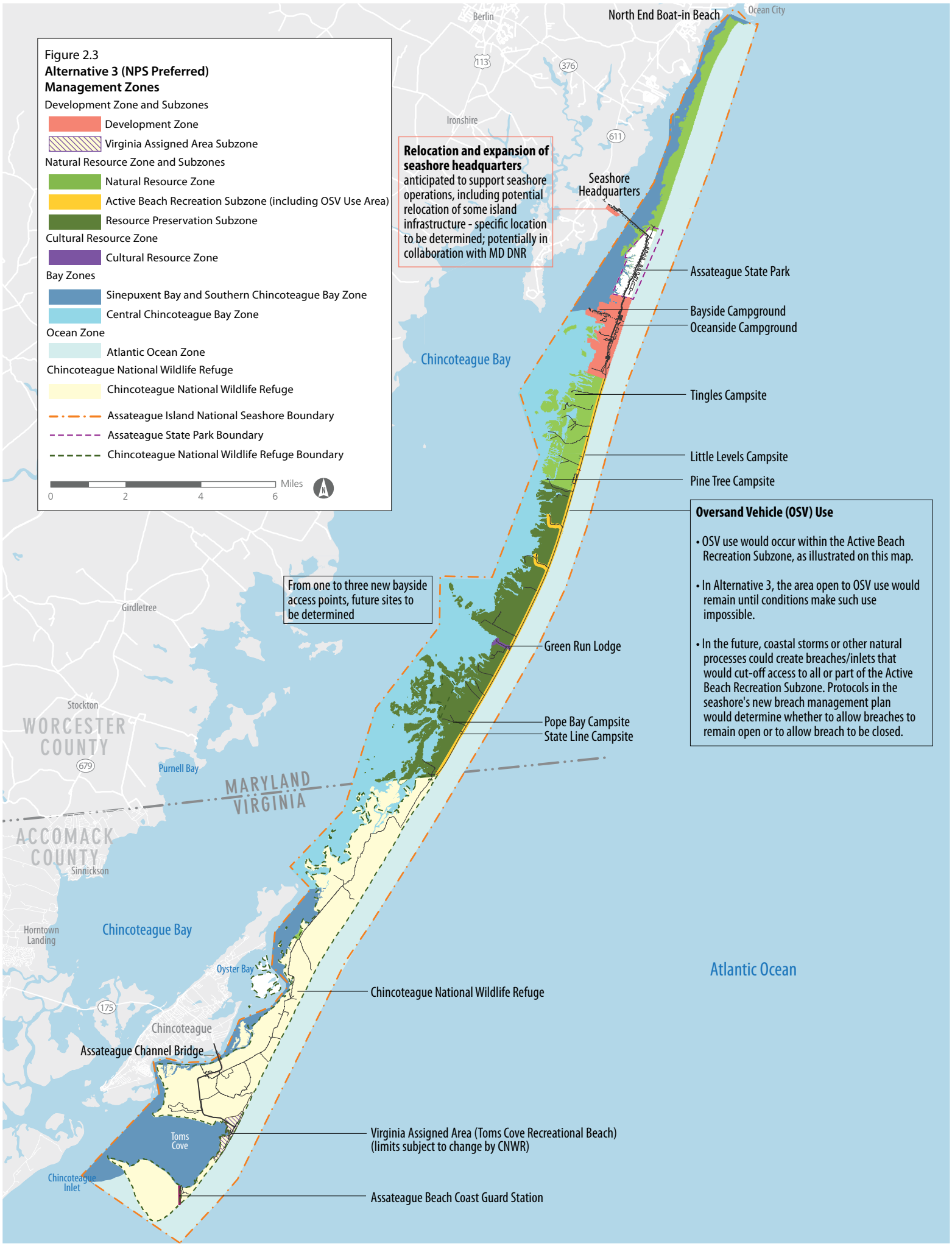
Figure 2.3
Alternative 3 (NPS Preferred)
Management Zones
Development Zone and Subzones
Development Zone
Virginia Assigned Area Subzone
Natural Resource Zone and Subzones
Natural Resource Zone
Active Beach Recreation Subzone (including OSV Use Area)
Resource Preservation Subzone
Cultural Resource Zone
Cultural Resource Zone
Bay Zones
Sinepuxent Bay and Southern Chincoteague Bay Zone
Central Chincoteague Bay Zone
Ocean Zone
Atlantic Ocean Zone
Chincoteague National Wildlife Refuge
Chincoteague National Wildlife Refuge
Assateague Island National Seashore Boundary
Assateague State Park Boundary
Chincoteague National Wildlife Refuge Boundary
0
2
4
6
Miles
Berlin
North End Boat-in Beach
Ocean City
113
376
Ironshire
611
Relocation and expansion of seashore headquarters anticipated to support seashore operations, including potential relocation of some island infrastructure - specific location to be determined; potentially in collaboration with MD DNR
Seashore Headquarters
Assateague State Park
Bayside Campground
Oceanside Campground
Chincoteague Bay
Tingles Campsite
Little Levels Campsite
Pine Tree Campsite
Oversand Vehicle (OSV) Use
• OSV use would occur within the Active Beach Recreation Subzone, as illustrated on this map.
• In Alternative 3, the area open to OSV use would remain until conditions make such use impossible.
• In the future, coastal storms or other natural processes could create breaches/inlets that would cut-off access to all or part of the Active Beach Recreation Subzone. Protocols in the seashore's new breach management plan would determine whether to allow breaches to remain open or to allow breach to be closed.
From one to three new bayside access points, future sites to be determined
Girdletree
Green Run Lodge
Stockton
WORCESTER COUNTY
679
Pope Bay Campsite
State Line Campsite
Purnell Bay
MARYLAND
VIRGINIA
ACCOMACK COUNTY
Sinnickson
Horntown Landing
Chincoteague Bay
Atlantic Ocean
Oyster Bay
Chincoteague National Wildlife Refuge
175
Chincoteague
Assateague Channel Bridge
Toms Cove
Virginia Assigned Area (Toms Cove Recreational Beach)
(limits subject to change by CNWR)
Chincoteague Inlet
Assateague Beach Coast Guard Station

developed at an existing backcountry campground (such as Green Run) for use by visitors accessing the island via motorized vessel. The bayside access points would include basic visitor amenities (e.g. removable vault toilet, shade shelter, and docking/mooring facilities), and a cross-island trail to provide access to the ocean side for beach recreation. A new primitive campground would be developed on Egging Island to support environmental education programs. Visitor use of the north end via boating would continue. Minimal visitor use facilities (such as a vessel with a restroom) could be developed to reduce visitor use impacts. A docking/entrance fee would be implemented.

- **Oversand Vehicle Use Area (Active Beach Subzone)**

Opportunities for driving on the beach (and associated recreation activities) in Maryland would continue within the seashore's existing OSV use area until conditions change. OSV use would be managed for maximum flexibility to respond to changing conditions, protect sensitive resources, and minimize conflicts with other seashore uses. If vehicular access to the OSV use area is lost due to natural coastal processes and/or the effects of climate change/sea level rise (e.g. a persistent breach occurs in the OSV use area and the breach management plan calls for it to stay open), consideration would be given to modifying the route or relocating it to another more suitable location, however the zone would always be located east of the winter high tide mark. Similarly, the location of the OSV overnight camping area (Bullpen) would be flexibly located to respond to island changes. Any proposed change in OSV use area and/or management would consider all relevant issues (e.g. threatened and endangered species, habitat protection, operational constraints, etc.). If the OSV use area is to be moved north of Assateague State Park, then NPS would modify existing regulations in 36 CFR§7.65(b), pertaining to operation of OSVs at the seashore, to permit travel by OSV between Assateague State Park and the Ocean City Inlet.

- **Virginia Developed Area (Virginia Assigned Area Subzone)**

The NPS would continue to support beach-oriented recreation uses in the assigned area in Virginia within Chincoteague National Wildlife Refuge. Management actions would be common to alternatives 2, 3 and 4 as described above in section 2.4.3.

### 2.6.3 VISITOR FACILITIES AND INFRASTRUCTURE (ALTERNATIVE 3) (NPS PREFERRED ALTERNATIVE)

Over time, visitor facilities and infrastructure would evolve in design (for compatibility with natural coastal processes), and could shift to new, more sustainable locations both on and off the island in order to maintain visitor use opportunities. Any proposed new visitor facilities development, rehabilitation, or post-storm reconstruction would be undertaken only after appropriate climate change and sea level rise risk assessments have been completed.

- **Maryland Mainland Developed Area (Development Zone)**

Existing mainland visitor use facilities (visitor center and environmental education center) would remain at their current locations. Rehabilitation of the previous visitor center as the seashore's environmental education center would be completed, making the facility a completely stand-alone structure. The existing operational facilities (administrative and maintenance) would be demolished and a new facility built at another mainland location; this would allow development of a shuttle/ferry parking facility at the current site (see following section). A value analysis would be conducted in the future to confirm that demolition and rebuilding the existing operational facilities is the suitable course of action.

A new campground would be developed on the mainland when camping facilities are no longer sustainable in the island developed area. The NPS would collaborate with MD DNR to explore relocation opportunities and options for future management of possible new mainland camping facilities as well as the new operational facilities (administrative and maintenance). Facilities could potentially be located on nearby land already owned by MD DNR.

- **Maryland Access and Transportation**

**Transportation System Management.** Two existing points of departure from the mainland would be acquired from Worcester County to encourage and facilitate water-based access to the island. Enhancements would be made to the sites, as needed, to provide boat launch ramps, docks and piers, restrooms, picnic facilities, parking lots, and visitor contact station facilities.

**Response to Storm Damage and Contingency Planning.** Traditional automobile access to the seashore would be supported as long the bridges and roadways remain useable. Contingency planning in the form of an alternative transportation systems (ATS) plan would prepare for the potential loss of road and/or bridge access. Should the bridges to the island be damaged or fail, the NPS with the state of Maryland would assess the feasibility of bridge repair and maintaining vehicular access. If bridge repair and vehicular access are not feasible, the seashore would pursue implementation of the ATS plan. Access to the island would likely shift to a fully water-based system composed of a new passenger ferry (based near the current seashore headquarters complex) and the network of existing public access sites on the mainland in Worcester County.

Access to the island via water-based means would be strongly encouraged and supported through investments in ATS infrastructure both on and off the island. New waterfront facilities would be developed to support the pedestrian ferry system and day-to-day seashore operations. This would include marina facilities for water-based operations and island access by NPS staff. The NPS would implement a permit system to better manage water-based access to the north end (e.g. docking/mooring pass). Commercial service

providers would be encouraged to provide water-based access to the seashore at multiple locations. On the island, a shuttle system and trail network would be developed to move visitors from the island ferry terminal to locations within the island developed area.

### 2.6.4 NATURAL RESOURCE MANAGEMENT (ALTERNATIVE 3) (NPS PREFERRED ALTERNATIVE)

Over time natural resource protection programs would expand and the scope of some existing programs would change to address the increasingly complex resource management issues created by global climate change/sea level rise. The scope of existing programs could, however, change as resources are increasingly influenced by the effects of accelerating sea level rise and changing climatic conditions.

The seashore would expand its capacity to address threats from climate change/sea level rise. The primary focus would be actions to enhance the resiliency of vulnerable resources (e.g. saltmarsh habitats, freshwater wetlands), monitor key climate drivers and resource conditions, and improve the sustainability of visitor use and seashore operations. There is, however, considerable uncertainty as to the range and severity of climate change/sea level rise impacts and the associated resource management needs.

The NPS would encourage the state of Maryland to develop an oyster sanctuary within the seashore boundary, if feasible.

Cooperative research would expand, accelerating growth in the understanding of seashore resources and ecological processes.

- **Potential and Recommended Wilderness Area (Resource Protection Subzone)**

As proposed under the actions common to all alternatives, the NPS would undertake an assessment of eligibility and prepare a new wilderness study. The wilderness study would address the following proposals related to the OSV corridor and administrative access to the backcountry:

- Consider moving the eastern boundary of the proposed wilderness area westward from the mean high water line of the Atlantic Ocean to a line approximately 50 meters west of the ocean beach winter storm berm, to allow OSV use on the beach below the winter storm berm and on the two cross island sand roads (from KM 16 to the state line).
- Consider excluding the two existing public cross-island bay access sand roads at Fox Hills and Big Levels and the access road to Green Run from the wilderness area. Some operational access would be needed to maintain backcountry campground restrooms but seashore staff would look to find ways to minimize the access need.

- Consider establishing an administrative area within the vicinity of Green Run Bay, to include the Green Run backcountry campsite, the former Green Run Hunting Lodge property, and the associated access road.

As in alternative 2, the seashore would generally manage potential and recommended wilderness to preserve, restore, and enhance natural ecological conditions and wilderness qualities while providing limited opportunities for low density, low impact primitive recreation experiences.

The seashore would also implement a long-term monitoring program to assess the condition and trends of wilderness character over time based on the "keeping it wild" framework, adapted for the individual characteristics of the Assateague Island wilderness.

The principles of adaptive management would be applied to wilderness under this alternative as the influences of climate change and seal level rise and the need for administrative and public access would require some flexibility in response.

- **Privately-Owned Structures**

The NPS would initiate an assessment of privately owned structures (oyster watch houses) located within the seashore's Virginia waters to determine the legal status and authority for their presence. NPS would pursue removal of any unauthorized structures, and would work cooperatively with the state of Virginia and Accomack County to ensure compliance with applicable natural resource conservation and wastewater treatment and disposal regulations at any authorized structures. The NPS would also assess the legal status of private hunting blinds and duck blinds within the seashore's Virginia waters.

### 2.6.5 CULTURAL RESOURCE MANAGEMENT (ALTERNATIVE 3) (NPS PREFERRED ALTERNATIVE)

In alternative 3 NPS would implement sustainable management strategies for both known and currently unknown cultural resources while allowing natural coastal processes and the effects of climate change/sea level rise to proceed unimpeded. Management strategies would emphasize identification of currently unknown resources, and documentation of resources threatened by natural coastal processes and the effects of climate change/sea level rise. At-risk resources would be documented prior to loss. Other mitigation needs would be evaluated on a case-by-case basis, based upon resource significance and value analysis following a storm event.

- **Assateague Beach U.S. Coast Guard Station (Cultural Resource Zone)**

In alternative 3, management actions would protect and maintain the Assateague Beach U.S. Coast Guard Station in situ until the site and/or structures are no longer sustainable, including (as in alternative 1) adequate maintenance to keep structures in good condition, replacement of electrical service, and repairs to the boat dock consistent with

the historic character of the property. In alternative 3, NPS would also seek partners to rehabilitate and adaptively reuse the station, perhaps including a historic lease on the structure or with commercial service providers to provide access, if the land area is stable long enough to justify a historic lease. Management actions by the NPS and its partners would seek to protect the site and related structures as long as feasible by minor manipulation of the natural environment. Protection would likely require some development of non-structural storm protection features, including some future stabilization of the bayside shoreline.

As in alternative 1, if damage occurs to historic structures and/or the cultural landscape, the NPS would conduct a value analysis to determine whether or not repairs would be made, taking into consideration the historic significance of the structures and cultural landscape, the level of damage, and the likelihood of further damage from natural coastal processes and the effects of climate change/sea level rise. NPS would also follow NPS guidelines for the treatment of historic structures likely to be affected by climate change. If it is determined that the historic structures and cultural landscape have become so damaged by coastal storms, sea level rise, or other climate change related issues that they create a hazard, NPS would document the resources in accordance with the *Secretary of the Interior's Standards* (NPS 1995c) and other NPS policies, guidelines, and standards. Then NPS would likely demolish the structures and rehabilitate the sites to foster a return to natural conditions.

- **Green Run Lodge**

In alternative 3, the NPS would rehabilitate and adaptively reuse the historic structures at Green Run Lodge, potentially to provide for a contact station for one of the new backcountry bay to island access points. Actions would also be taken to protect and stabilize the bay shoreline to better withstand future storm damage and to maintain boat access for visitors to the backcountry. If damage occurs to the historic structure and/or boat docks and stabilized shoreline, the NPS would conduct a value analysis as described above for the Assateague Beach U.S. Coast Guard Station. If it is determined that the historic structures and cultural landscape have become so damaged by coastal storms, sea level rise, or other climate change related issues that they create a hazard, NPS would document the resources in accordance with the *Secretary of the Interior's Standards* (NPS 1995c) and other NPS policies, guidelines, and standards. Then NPS would likely demolish the structures and rehabilitate the sites to foster a return to natural conditions.

### 2.6.6 SEASHORE OPERATIONS (ALTERNATIVE 3) (NPS PREFERRED ALTERNATIVE)

The scope and complexity of seashore operations would change as the island visitor use infrastructure becomes more sustainable. Additional changes would occur if administrative facilities move to new mainland locations, and when use of the backcountry is facilitated through development of new bayside points of access.

Changes would also occur with development of alternative transportation systems, particularly if automobile access to the island is lost due to natural coastal processes or the effects of climate change/sea level rise. Specific changes would include:

- **Visitor Use Management.** Visitor use management would become more complex as use of the backcountry expands with the development of new bayside access points (e.g. camping reservation system, enhanced patrol and visitor protection needs). If natural coastal processes alter OSV access and use, the scope of required management activities would likely change. Reduced OSV access to the southern portion of the seashore would likely require that some management activities become water-based. Should all automobile access be lost, overall visitation to the island would likely decline, although the distribution of visitor use would remain relatively unchanged. The loss of traditional access would complicate emergency response, and likely require more staff with advanced training.
- **Facility Management.** The scope and complexity of facility management on the island would likely change and potentially decrease as visitor use facilities and infrastructure transition to more sustainable designs. Conversely, in the backcountry the scope of park operations would increase because new facilities – such as new water-based access points – would require patrolling and maintenance, and the spatial distribution of facilities would expand. Should an overflow shuttle or ferry system be implemented, each would also expand facility management needs. Both would involve new structures and infrastructure requiring upkeep and maintenance. The loss of automobile access would also require a transition to water-based access for all island facility management activities, resulting in a substantial increase in complexity, particular for waste management.
- **Resource Protection and Management.** The loss of automobile access to the island and/or backcountry would add complexity to resource protection/management functions owing to the logistical difficulties of water-based access. Should the size of the OSV use area decrease over time, then the loss of access for public deer hunting could affect the ability to meet deer management objectives; in this event, seashore managers would explore options and take actions to manage herd sizes, as appropriate.
- **Commercial Services Management.** The scope and complexity of management activities needed to oversee commercial services would increase when shuttle and ferry systems are implemented. Additional complexity would accrue if commercial providers initiate water-based access services at the proposed new Chincoteague Bay departure sites.
- **Fee Structure and Revenue.** Recreational fees for use of the island developed area would be unlikely to increase more than the rate of inflation as the design and management of facilities and infrastructure in the island developed area becomes more sustainable, and as services and amenities simplify over time.

The overall cost of visiting the island could increase with the addition of commercial service fees for accessing the seashore by shuttle when parking capacity is reached, or if vehicle access is lost and replaced by ferry service. Visitors would also face new costs if they choose to use a commercial service provider to access the backcountry at the new bayside locations. Private boaters might also face increased costs if the proposal to require a landing/mooring permit is implemented. Revenue to the NPS would likely remain relatively static under alternative 3 although the sources of revenue could change over time if traditional automobile access shifts to water-based access. If OSV access is lost due to changing environmental conditions, overall revenue to the seashore would likely decrease substantially.

- **Staffing.** Approximately six additional full-time equivalent staff would be needed. Staffing needs related to visitor use would increase as new opportunities to access the backcountry are provided. Similarly, staffing needs related to resource management and protection would also likely increase as the potential for visitor use impacts expands into new areas and as proactive efforts to enhance resource resiliency in the face of climate change/sea level rise are implemented. The types of staff expertise required would likely remain relatively constant. Should automobile access to the island be lost, overall staffing needs and/or the types of expertise needed could change due to the shift to water-based operations.
- **Administration.** Administrative functions and needs would likely remain relatively constant except that new expertise could be needed to manage the expanded range of commercial services being provided as well as potential for ferry operation.

### 2.6.7 PARTNERSHIPS (ALTERNATIVE 3) (NPS PREFERRED ALTERNATIVE)

Existing partnerships and cooperative relationships that support ongoing management would continue. Partnerships would likely expand with Assateague State Park and Chincoteague National Wildlife Refuge as cooperative solutions are developed to address the effects of natural coastal processes and/or climate change/sea level rise. The NPS and Assateague State Park would explore ways to improve operational efficiency, increase cost effectiveness, and enhance the quality and seamlessness of visitor experiences. Opportunities would include the potential for co-locating facilities, joint operations, sharing resources and expertise, and broader collaboration in addressing conservation and resource management needs both on and off the island.

Partnership activity with the scientific and educational communities would expand with efforts to enhance resource resiliency and climate change adaptation. NPS would collaborate with partners to expand research to improve understanding of aquatic resources, estuarine ecology, and the effects of human activities on water quality, both water-based and in the watershed. If recreation amenities in Maryland move from the island to the mainland, new partnerships with Worcester County and adjacent

landowners would be required. Relationships with commercial service providers would likely expand with new alternative transportation systems and efforts to improve accessibility to the backcountry.

### 2.6.8 LAND ACQUISITION (ALTERNATIVE 3) (NPS PREFERRED ALTERNATIVE)

The NPS would seek to acquire land in the general vicinity of the Maryland headquarters complex sufficient to support relocation of the administrative and maintenance facilities, some island facilities, and transportation infrastructure (20 to 200 acres). Relocation of the headquarters complex would make available the existing site as a base of operations for a future alternative transportation system. New land that may be acquired could also be used to support relocation of some island facilities and infrastructure away from vulnerable areas if and when the need arises, and to protect the scenic character of visitor routes to the new sites. The NPS would collaborate with MD DNR to explore options for using state-owned property and/or acquiring new lands for two new points of departure on the mainland near the state park and current NPS developed area for a future ferry system and new shared fee booths. NPS would also support partner and/or direct NPS development of one to three points of departure on the mainland for mid-island access (150 to 200 acres). To the extent possible, NPS would collaborate with federal, state or county partners to develop these mainland access points, with direct NPS development occurring if partnership development was not feasible.

Additionally, NPS would support partner groups who seek to acquire various types of legal interests in lands within the Chincoteague Bay watershed for conservation and climate change adaptation purposes (3,000 to 5,000 acres). NPS would collaborate with other federal, state, and county agencies and non-governmental organizations, including the FWS, to protect these lands.

### 2.6.9 SEASHORE BOUNDARY (ALTERNATIVE 3) (NPS PREFERRED ALTERNATIVE)

NPS would seek an increase in the seashore's authorized boundary ceiling for acquiring interests in land (fee simple and easements) on the mainland in Worcester County, Maryland, for purposes of the following:

- addressing operational and management issue (enabling acquisition of from 20 to 200 acres for relocation of the seashore's headquarters complex, some relocated island facilities and infrastructure, and new public access sites for island transportation)
- enhancing public enjoyment related to the purposes of the seashore (enabling acquisition of from 150 to 200 acres of land to establish one to three mainland points of departure that would provide alternative access sites for the mid-island area if needed as a result of sea level rise – this might consist of direct acquisition of sites, or partnership acquisition of buffer areas to protect these access points from the effects of climate change)

### 2.6.10 EXAMPLES OF ACTIONS NEEDED TO ACHIEVE DESIRED FUTURE CONDITIONS (ALTERNATIVE 3) (NPS PREFERRED ALTERNATIVE)

Table 2.7 identifies some of the actions needed in alternative 3 to move from existing conditions to desired conditions in alternative 3.

### 2.6.11 COSTS (ALTERNATIVE 3) (NPS PREFERRED ALTERNATIVE)

The NPS has prepared estimates of annual operating costs and one-time costs associated with alternative 3 using NPS and industry cost estimating guidelines (see table 2.11 in section 2.10). Annual recurring costs include personnel and non-labor costs, such as utilities, vehicles, travel, and supplies. One-time capital investments include construction, exhibits, research and planning. These costs are presented for comparative purposes only and will be refined at a later date based upon final design of facilities and other considerations. Some projects have the potential to be funded through partnerships and volunteers, or through shared funding with other agencies. Therefore, actual costs would vary depending on when specific actions are implemented and on contributions by partners and volunteers.

- **NPS Annual Operating Costs and Staffing Requirements**

NPS annual operating costs associated with alternative 3 are estimated to be $6,364,000 (2012 dollars). This includes the anticipated cost for staff salaries and benefits for 48 full-time equivalent (FTE) staff, utilities, supplies, services, and other materials needed for seashore maintenance and operations. The FTE number indicates funded NPS staff only, and does not include volunteer positions, positions funded by partners, or staff hired by NPS with other funds, such as Federal Land Recreation Enhancement Act fees, 54 U.S.C. 101702 funds (commonly referred to as "living exhibits and interpretive demonstrations" fees), special use permit fees, and commercial use authorization funds.

- **One-Time Costs**

Total one-time costs associated with alternative 3 are estimated to be $28,499,888 (2013 dollars) including one-time facilities costs and non-facilities costs. Land acquisition costs and contingency costs are not included.

The NPS share of these one-time costs is estimated at approximately is $27,432,624 (96% of total one-time costs) (2013 dollars). Major facilities costs include those for:

- replace existing administrative offices
- replace existing maintenance facilities
- rehabilitate environmental education center
- land-based alternative transportation system
- new mainland points of departure
- boat dock repairs at the former Assateague Beach U.S. Coast Guard Station

Major non-facilities costs include those for:

- enhancing seashore recreation opportunities by restoring island habitats and processes altered by past non-NPS development activities
- relic mosquito ditch restoration
- phragmites control
- saltmarsh restoration

Total one-time partner costs are estimated at approximately $1,067,264 (4% of total one-time costs) (2013 dollars). Major partner costs include those for:

- road and parking area pavement management projects (FHWA)

**Table 2.7 Alternative 3 (NPS Preferred) – Examples of Actions Needed to Achieve Desired Future Conditions**

| | | Examples of the Types of Actions Needed |
|---|---|---|
| **Seashore-Wide Topics** | **Natural Resource Management** | ▪ expand and diversify partnerships to enhance understanding of resource stewardship:<br>- with Assateague State Park and US FWS to address effects of natural coastal processes and/or climate change/sea level rise |
| | **Cultural Resource Management** | (no actions identified) |
| | **Visitor Experience Enhancements** | ▪ expand and diversify partnerships to maintain existing visitor experiences<br>- with Assateague State Park to enhance operational efficiency, cost effectiveness and quality and seamlessness of visitor experience<br>- with Worcester County and adjacent landowners to enable relocation of facilities to the mainland<br>- with commercial service providers to provide seashore access and visitor services (if access is lost) |
| | **Other Special Studies** | ▪ develop plan to expand ATS in the event automobile access is lost, including the potential use of a passenger ferry system with shelters and methods to distribute visitors within developed area (e.g. trails, on-island shuttle system)<br>▪ develop a plan for water-based park maintenance operations to implement in the event automobile access is lost |
| **Development Zone** | **Maryland Island Developed Area** | ▪ maintain existing facilities and infrastructure until such time as they are lost, damaged, or become obsolete<br>▪ over time, gradually transition to sustainable infrastructure and facilities (contingency action)<br>▪ when facilities and infrastructure are lost, damaged, or become obsolete (contingency actions):<br>- relocate sustainable facilities to more stable areas within the Maryland Island Developed Area<br>- collaborate with MD DNR in potentially relocating non-sustainable facilities to the mainland<br>- remove hardened infrastructure associated with damaged or relocated facilities<br>- rehabilitate lands and landscape as facilities and infrastructure are removed<br>▪ as Oceanside RV campgrounds become unsustainable, remove and replace with less infrastructure dependent camping opportunities (contingency action)<br>▪ design all new and/or replacement facilities to be compatible with natural coastal processes and the effects of climate change (contingency action)<br>▪ seek to allow breaches and/or new inlets to evolve naturally, in accordance with the breach management plan<br>▪ minimally maintain existing artificial dune system using methods such as allowing natural westward migration assisted with sand fencing<br>▪ when access is lost implement ferry-based ATS operations (island docking facility, wayfinding system, on-island shuttle (routes), shuttle shelters and benches, trail improvements) (contingency action)<br>▪ expand lifeguard operations to address potential dispersal of visitors within developed area resulting from implementation of ATS (contingency action)<br>▪ retain, but reduce size of island maintenance yard (bone yard) to support operations<br>▪ when access is lost implement water-based operations (island docking facility, emergency response, wastewater handling equipment)<br>▪ consider new commercial services to provide minimal visitor use amenities |
| | **Maryland Mainland Developed Area** | ▪ complete rehabilitation of the previous visitor center as a stand-alone environmental education center<br>▪ relocate park headquarters complex and maintenance facilities (likely to be co-located with new state park facilities) (final decision dependent upon outcome of value analysis)<br>▪ possibly develop new campground after consultation with Assateague State Park<br>▪ when access is lost:<br>- implement plan for an expanded ATS including development of a ferry terminal facility and ferry terminal parking (contingency action)<br>- implement plan for water-based park maintenance operations, including development of a mainland docking facility (contingency action)<br>▪ acquire additional land base as necessary to support new facilities, including:<br>- from 20 to 200 acres for relocation of Maryland headquarters complex, some relocated |

**Table 2.7 Alternative 3 (NPS Preferred – Examples of Actions Needed to Achieve Desired Future Conditions (continued)**

| | | Examples of the Types of Actions Needed |
|---|---|---|
| | | island facilities and infrastructure, and new public access sites for island transportation (amount of land acquisition would vary depending upon degree of collaboration with MDDNR and whether existing state-owned property could be used)<br>- support partner and/or direct NPS development of one to three points of departure on the mainland for mid-island access (150 to 200 acres)<br>- support partner groups who seek to acquire various types of legal interests in lands within the Chincoteague Bay watershed for conservation and climate change adaptation purposes |
| | **Virginia Assigned Area Subzone** | (no actions identified in addition to those common to alternatives 2, 3, and 4) |
| **Natural Resource Zone** | **Primary Zone** | ▪ develop primitive campsite on Egging Island for use in environmental education programs<br>▪ expand long-term monitoring efforts to include key climate drivers<br>▪ support cooperative research efforts to better understand the effects of climate change and to develop adaption strategies<br>▪ enhance and expand outreach and education programs focused on climate change adaptation<br>▪ identify resources vulnerable to the effects of climate change and work to enhance resiliency<br>▪ develop 1 to 3 new bayside access points to facilitate water-based visitation – may include docks/mooring areas, cross-island trails, and restroom facilities – one site could be developed at an existing backcountry campsite to provide opportunities for camping access via motorized vessels<br>▪ encourage commercial service operators to provide water transportation to the backcountry recreation areas<br>▪ maintain use of north end boat-in beach and develop facilities to accommodate use and minimize resource impacts<br>▪ implement a permit system to manage water-based access to the north end (e.g. docking/ mooring pass)<br>▪ expand capacity of maintenance division to protect and maintain new backcountry use areas |
| | **Active Beach Recreation Sub Zone** | ▪ consider re-locating all or a portion of the OSV use area should vehicle access be lost (if the breach management plan recommends that the breach remain closed)<br>▪ flexibly manage OSV use to minimize resource impacts and maximize visitor satisfaction (seasonal changes in location and extent of use areas, etc.)<br>▪ flexibly manage the 'Bullpen' |
| | **Resource Preservation Sub Zone** | ▪ with respect to potential and recommended wilderness, undertake an assessment of eligibility and prepare a new wilderness study that addresses the following:<br>- consider moving the eastern boundary of the proposed wilderness area westward from the mean high water line of the Atlantic Ocean to a line approximately 50 feet west of the ocean beach winter storm berm<br>- consider establishing an administrative area within the vicinity of Green Run Bay, to include the Green Run backcountry campsite, the former Green Run Hunting Lodge property, and the associated access road (removing approximately 4 acres from the proposed wilderness area)<br>- consider establishing two administrative corridors around the existing Fox Hills and Big Levels public cross island bayside access sand roads (removing approximately 5 acres from the proposed wilderness area) |
| **Cultural Resource Zone** | **Primary Zone** | ▪ at the former Assateague Beach U.S. Coast Guard Station:<br>- protect and maintain the station in situ (including repairs to boat dock and replacement of electric services) until no longer sustainable in the context of natural coastal processes and/or the effects of climate change/sea level rise, pending the outcome of a value analysis after each storm event<br>- seek partners to rehabilitate and adaptively reuse the station<br>- implement non-structural storm protection features, including some future stabilization of the bayside shoreline and ocean side primary dune system<br>▪ at the former Green Run Lodge:<br>- protect and maintain the lodge in situ until no longer sustainable in the context of natural |

**Table 2.7 Alternative 3 (NPS Preferred Alternative) – Examples of Actions Needed to Achieve Desired Future Conditions (continued)**

| | | Examples of the Types of Actions Needed |
|---|---|---|
| | | coastal processes and/or the effects of climate change, pending the outcome of a value analysis after each storm event<br>- rehabilitate and adaptively reuse the lodge to provide a contact station for one of the new backcountry to bay island access points<br>- maintain boat access for visitors to the backcountry |
| **Central Chincoteague Bay** | **Primary Zone** | ▪ expand and support collaboration with partners to better understand, monitor and protect estuarine resources<br>▪ encourage the state of Maryland to establish an oyster sanctuary, if feasible<br>▪ initiate an assessment of privately owned structures (e.g. oyster watch houses and duck blinds) located within the seashore's Virginia waters to determine their legal status; pursue removal of any unauthorized structures<br>▪ work with Virginia to ensure appropriate wastewater treatment and disposal at authorized structures (e.g. oyster watch houses)<br>▪ enact public use closures as needed to protect marine mammal concentration areas and colonial waterbird breeding sites<br>▪ develop infrastructure (docks, mooring areas, channel markers, etc.) to support 1to 3 new bayside access points<br>▪ implement a permit system to manage water-based access (e.g. docking/mooring pass) |
| **Sinepuxent and Southern Chincoteague Bay** | **Primary Zone** | ▪ expand and support collaboration with partners to better understand, monitor and protect estuarine resources<br>▪ encourage the state of Maryland to establish an oyster sanctuary, if feasible<br>▪ initiate an assessment of privately owned structures (e.g. oyster watch houses and duck blinds) located within the seashore's Virginia waters to determine their legal status; pursue removal of any unauthorized structures |
| **Atlantic Ocean** | **Primary Zone** | ▪ work with and support partners to better understand, monitor and protect marine resources |

## 2.7 Alternative 4 – Natural Island Evolution and a Primitive Island Experience

### 2.7.1 OVERALL CONCEPT

Natural evolution of the island would occur without interference and subject to the full effects of natural coastal processes and/or climate change/sea level rise. Breach management protocols would generally seek to let the island evolve naturally. Impacts to natural sand transport processes from the jetty-stabilized Ocean City Inlet would continue to be mitigated. Existing visitor use facilities and infrastructure would remain in the island developed area in Maryland until such time as they are lost and/or damaged by natural coastal processes or become obsolete. In response to the threat from climate change/sea level rise, minimal future investments would be made on the Maryland portion of the island, limited to development and maintenance of sustainable, low impact day-use facilities and primitive camping infrastructure. Planning and development of an alternative transportation system including a passenger ferry from the mainland would prepare the seashore for possible loss of traditional land access. Over time visitor use would shift to primarily day-use activities in a more primitive island setting. More emphasis would be placed on the role of the seashore as a protected natural environment and living laboratory for scientific research and study.

In Virginia, the NPS would continue to support beach-oriented recreation uses in the Island developed area within Chincoteague National Wildlife Refuge (see actions common to alternatives 2, 3 and 4 – Visitor Use and Visitor Experience in Virginia).

### 2.7.2 VISITOR USE AND EXPERIENCE (ALTERNATIVE 4)

The seashore's two visitor centers would continue to provide orientation, information, interpretive programs, and exhibits. Changes in island accessibility would likely result in a greater emphasis on visitor orientation. When implemented, staff would make use of new points of departure such as ferry terminals and shuttle staging areas to provide orientation, safety messaging, and basic information about the seashore.

Climate change messages and information related to the expanding role of the seashore as a laboratory for studying climate change/sea level rise would provide a basic foundation for programming. Traditional ranger-led activities and curriculum-based environmental education programs would also continue, but the location of activities in the Maryland portion of the seashore would gradually shift away from the island as access becomes less automobile-based. As the seashore evolves to more of a day-use destination, resources currently used for on-site programs would likely be redirected to other services. Early childhood education would also likely contract as access to and on the island becomes more challenging. With the transition to more primitive conditions, there would be an increased need to engage the community and maintain support for the seashore; outreach efforts would likely increase and target all members of the

community including underrepresented segments. Web-based and other non-personal services would likely become a much more important means of communicating with the public about how to access and use the seashore.

The risk to continued visitor use at the seashore would be low to moderate. Contingency planning – including development to alternative means of accessing the island – would reduce the potential for the seashore to become inaccessible to visitors following major storm events. Although similar to alternative 3, actions in alternative 4 would occur over a shorter time and does not allow facilities to be moved to more stable areas on the island.

- **Maryland Island Developed Area (Development Zone)**

Traditional recreation uses in the island developed area would continue. However, existing facilities would not be repaired or replaced in kind when damaged by natural coastal processes or the effects of climate change/sea level rise. Some existing recreation opportunities such as island developed area RV camping, would eventually be phased out. Over time visitor use in the Maryland portion of the seashore would transition to become almost exclusively day-use. Most recreation opportunities would continue to be available but as more primitive experiences. Limited primitive camping would continue to be available.

Ultimately visitor use facilities would support only day-use recreation. If existing roadways and parking facilities are lost or damaged, they would not be repaired, replaced, or relocated. Instead a mainland-based commercial shuttle would provide access. Should the bridges to the island be damaged or fail, access to the island would shift to a fully water-based system composed of a new passenger ferry and water-based access offered by commercial service providers operating from existing public access sites on the mainland. The combined ranger station/campground office would be maintained on the island as long as it remains sustainable. When no longer practical, it would be replaced by a less permanent, moveable facility. The existing maintenance yard would be phased out as traditional facilities and infrastructure are removed from the island.

Most visitor services would continue, although the relative mix of services, location, and thematic emphasis would gradually shift over time as the island becomes less developed and accessible as the result of island dynamics and climate change/sea level rise.

- **North End and Backcountry Areas (Natural Resource Zone)**

Existing recreation uses of the seashore's backcountry and adjacent waters would continue as long as the required access remained available. Existing recreation facilities in the backcountry would be retained without new major investments. Visitor access to the north end via motorized vessels would no longer be permitted.

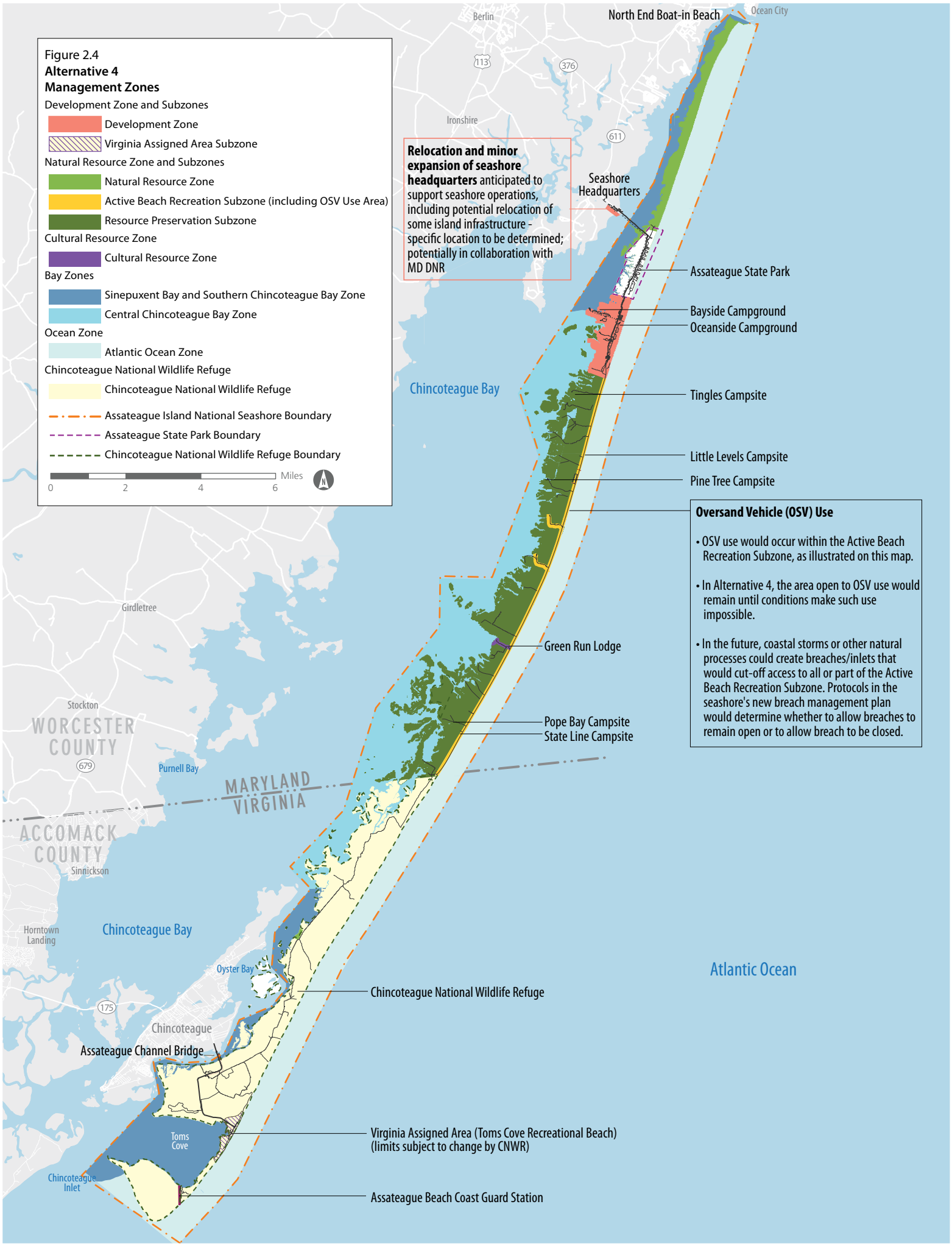
Figure 2.4
Alternative 4
Management Zones
Development Zone and Subzones
Development Zone
Virginia Assigned Area Subzone
Natural Resource Zone and Subzones
Natural Resource Zone
Active Beach Recreation Subzone (including OSV Use Area)
Resource Preservation Subzone
Cultural Resource Zone
Cultural Resource Zone
Bay Zones
Sinepuxent Bay and Southern Chincoteague Bay Zone
Central Chincoteague Bay Zone
Ocean Zone
Atlantic Ocean Zone
Chincoteague National Wildlife Refuge
Chincoteague National Wildlife Refuge
Assateague Island National Seashore Boundary
Assateague State Park Boundary
Chincoteague National Wildlife Refuge Boundary
0
2
4
6
Miles
Berlin
North End Boat-in Beach
Ocean City
113
376
Ironshire
611
Relocation and minor expansion of seashore headquarters anticipated to support seashore operations, including potential relocation of some island infrastructure - specific location to be determined; potentially in collaboration with MD DNR
Seashore Headquarters
Assateague State Park
Bayside Campground
Oceanside Campground
Chincoteague Bay
Tingles Campsite
Little Levels Campsite
Pine Tree Campsite
Oversand Vehicle (OSV) Use
• OSV use would occur within the Active Beach Recreation Subzone, as illustrated on this map.
• In Alternative 4, the area open to OSV use would remain until conditions make such use impossible.
• In the future, coastal storms or other natural processes could create breaches/inlets that would cut-off access to all or part of the Active Beach Recreation Subzone. Protocols in the seashore's new breach management plan would determine whether to allow breaches to remain open or to allow breach to be closed.
Girdletree
Green Run Lodge
Stockton
WORCESTER COUNTY
679
Pope Bay Campsite
State Line Campsite
Purnell Bay
MARYLAND
VIRGINIA
ACCOMACK COUNTY
Sinnickson
Horntown Landing
Chincoteague Bay
Oyster Bay
Atlantic Ocean
Chincoteague National Wildlife Refuge
175
Chincoteague
Assateague Channel Bridge
Toms Cove
Virginia Assigned Area (Toms Cove Recreational Beach)
(limits subject to change by CNWR)
Chincoteague Inlet
Assateague Beach Coast Guard Station

- **Oversand Vehicle Use Area (Active Beach Subzone)**

Opportunities for driving on the beach (and associated recreation activities) in Maryland would continue within the seashore's existing OSV use area until conditions change. If vehicular access to the OSV use area is lost due to natural coastal processes or the effects of climate change/sea level rise (e.g. a persistent breach occurs in the OSV use area and the breach management plan calls for it to stay open), then the OSV use area would be reduced or eliminated. Areas where OSV access is lost would permanently transition to resource preservation zoning.

- **Virginia Developed Area (Virginia Assigned Area Subzone)**

The NPS would continue to support beach-oriented recreation uses in the assigned area in Virginia within Chincoteague National Wildlife Refuge. Management actions would be common to alternatives 2, 3 and 4 as described above in section 2.4.3.

### 2.7.3 VISITOR FACILITIES AND INFRASTRUCTURE (ALTERNATIVE 4)

Over time visitor facilities and infrastructure would remain until they are lost or damaged by natural coastal processes or the effects of climate change/sea level rise.

- **Maryland Mainland Developed Area (Development Zone)**

Existing mainland visitor use facilities (visitor center and environmental education center) would remain at their current locations. Rehabilitation of the previous visitor center as the seashore's environmental education center would be completed, making the facility a completely stand-alone structure. The existing Maryland operational facilities (administrative and maintenance) would be demolished and a new facility built at another mainland location; this would allow development of a shuttle/ferry parking facility at the current site (see following section). The NPS would collaborate with MD DNR to potentially locate the new operational facilities (administrative and maintenance) on nearby land already owned by MD DNR. A value analysis would be conducted in the future to confirm that demolition and rebuilding the existing operational facilities is the suitable course of action.

- **Maryland Access and Transportation**

**Response to Storm Damage and Contingency Planning.** Traditional automobile access to the seashore would be supported as long the bridges and roadways remain useable. Contingency planning in the form of an alternative transportation systems (ATS) plan would prepare for the potential loss of road and/or bridge access. Should the bridges to the island be damaged or fail, the NPS would assess the feasibility of bridge repair and maintaining vehicular access. If bridge repair and vehicular access are not feasible, the seashore would pursue implementation of the ATS plan. Access to the island would likely shift to a fully water-based system composed of a new passenger ferry.

Access to the island via water-based means would be strongly encouraged and supported through investments in ATS infrastructure both on and off the island. New waterfront facilities would be developed to support the pedestrian ferry system and day-to-day seashore operations. This would include marina facilities for water-based operations and island access by NPS staff.

### 2.7.4 NATURAL RESOURCE MANAGEMENT (ALTERNATIVE 4)

Over time natural resource protection programs would expand as the seashore increasingly emphasizes resource preservation and its role as a natural laboratory for scientific research and study. As the scope and intensity of visitor use decreases over time, the emphasis of seashore programs would shift towards a greater focus on resource management and protection. The seashore would begin to serve a broader purpose as a natural laboratory to understand and address the consequences of climate change/sea level rise.

Existing resource programs and activities would continue although the relative importance of individual programs would be expected to change. Those directed towards the protection of sensitive resources from visitor use impacts would likely become less critical while activities related to broader ecosystem stressors (e.g. nutrient loading from watershed land use) could need to expand. New programs would focus on mitigating human impacts and climate change adaptation, including actions to enhance the resiliency of vulnerable resources, monitoring key climate drivers and resource conditions, and enhancing the sustainability of seashore operations.

The NPS would encourage the state of Maryland to develop an oyster sanctuary within the seashore boundary, if feasible.

The NPS would expand collaborative research relationships with government and academic scientists. The focus of research endeavors would likely shift from the current emphasis on short-term tactical research directed towards immediate management issues to a broader agenda of basic science and research into the effects of climate change/sea level rise on barrier island and coastal ecosystems. More NPS resources would be dedicated to the support of cooperative research.

- **Potential and Recommended Wilderness Area (Resource Protection Subzone)**

As proposed under the actions common to all alternatives, the NPS would undertake an assessment of eligibility and prepare a new wilderness study. The wilderness study would address the following proposals related to the OSV corridor and administrative access to the backcountry:

- Consider moving the eastern boundary of the proposed wilderness area westward from the mean high water line of the Atlantic Ocean to a line

approximately 50 meters west of the ocean beach winter storm berm, to allow OSV use on the beach below the winter storm berm and on the two cross island sand roads (from KM 16 to the state line.)

- Consider excluding the two existing public cross-island bay access sand roads at Fox Hills and Big Levels and the access road to Green Run from the wilderness area. Some operational access would be needed to maintain backcountry campground restrooms but seashore staff would look to find ways to minimize the access need.

As in alternative 2 and 3, the seashore would generally manage potential and recommended wilderness to preserve, restore, and enhance natural ecological conditions and wilderness qualities while providing limited opportunities for low density, low impact primitive recreation experiences.

The seashore would also implement a long-term monitoring program to assess the condition and trends of wilderness character over time based on the "keeping it wild" framework, adapted for the individual characteristics of the Assateague Island wilderness.

The principles of retreat would be applied to Assateague Island under this alternative as the influences of climate change and seal level rise become evident. There could be opportunities for areas that do not presently meet the requirements for wilderness eligibility to become eligible as developed areas are relocated or removed entirely. Under this alternative, wilderness would have the potential to grow.

- **Privately Owned Structures**

The NPS would initiate an assessment of the privately owned structures (oyster watch houses) located within the seashore's Virginia waters to determine the legal status and authority for their presence. NPS would pursue removal of any unauthorized structures, and would work cooperatively with the state of Virginia and Accomack County to ensure appropriate wastewater treatment and disposal at any authorized structures. The NPS would also assess the legality of private hunting blinds within the seashore's Virginia waters.

### 2.7.5 CULTURAL RESOURCE MANAGEMENT (ALTERNATIVE 4)

Alternative 4 would protect and maintain the seashore's known cultural resources until such time as they are damaged or lost due to natural coastal processes and the effects of climate change/sea level rise. No action would be taken to prevent impacts, or to repair or restore damaged resources.

- **Assateague Beach U.S. Coast Guard Station (Cultural Resource Zone)**

As in alternative 1, the former Assateague Beach U.S. Coast Guard Station would continue to be maintained subject to the availability of funding, including adequate

maintenance to keep structures in good condition, replacement of electrical service, and repairs to the boat dock consistent with the historic character of the property. Limited actions in terms of dune stabilization would be taken to protect the structures and cultural landscape from natural coastal processes and/or the effects of climate change/sea level rise.

As in alternative 1, if damage occurs to historic structures and/or the cultural landscape, the NPS would conduct a value analysis to determine whether or not repairs would be made, taking into consideration the historic significance of the structures and cultural landscape, the level of damage, and the likelihood of further damage from natural coastal processes and the effects of climate change/sea level rise. NPS would also follow NPS guidelines for the treatment of historic structures likely to be affected by climate change. If it is determined that the historic structures and cultural landscape have become so damaged by coastal storms, sea level rise, or other climate change related issues that they create a hazard, NPS would document the resources in accordance with the *Secretary of the Interior's Standards* (NPS 1995c) and other NPS policies, guidelines, and standards. Then NPS would likely demolish the structures and rehabilitate the sites to foster a return to natural conditions.

- **Green Run Lodge**

As in alternative 3, the NPS would rehabilitate and adaptively reuse the historic structures at Green Run Lodge, potentially to provide for a contact station for one of the new backcountry bay to island access points. Actions would also be taken to protect and stabilize the bay shoreline to better withstand future storm damage and maintain boat access for visitors to the backcountry. As in alternative 1, if damage occurs to the historic structure and/or the boat docks and stabilized shoreline, the NPS would conduct a value analysis as described above for the Assateague Beach U.S. Coast Guard Station. If it is determined that the historic structures and cultural landscape have become so damaged by coastal storms, sea level rise, or other climate change related issues that they create a hazard, NPS would document the resources in accordance with the *Secretary of the Interior's Standards* (NPS 1995c) and other NPS policies, guidelines, and standards. Then NPS would likely demolish the structures and rehabilitate the sites to foster a return to natural conditions.

### 2.7.6 SEASHORE OPERATIONS (ALTERNATIVE 4)

The scope and complexity of seashore operations would change as traditional recreation facilities and infrastructure are removed from the island and replaced with minimalist substitutes. Additional changes would occur if automobile access to the island is lost due to natural coastal processes or the effects of climate change/sea level rise. Specific changes would include:

- **Visitor Use Management**. The distribution of visitor use within the island developed areas and backcountry would remain relatively unchanged. Should a

persistent breach occur that further limits or eliminates access, and the breach management plan recommends that it remain open, OSV use, the scope of required management activities would be further reduced. Restricted OSV access would likely require that some management activities become water-based. Should all automobile access to the island be lost, overall visitation to the island would likely decline, and become predominantly day-use. The loss of traditional access to the island would complicate emergency response, and likely require more staff with advanced training.

- **Facility Management**. The scope and complexity of facility management needs would likely decrease as traditional visitor use facilities and infrastructure are removed from the island or replaced with minimalist alternatives. The limited day-use and new primitive camping facilities remaining on the island would require maintenance and upkeep. Should automobile access be lost, the development of a ferry system would expand facility management needs because of the new facilities and infrastructure involved. The loss of automobile access would also require a transition to water-based access for all island facility management activities, resulting in a substantial increase in complexity, particularly waste management.
- **Resource Protection and Management**. The loss of automobile access to the island and/or backcountry would add complexity to resource protection/management functions owing to the logistical difficulties of water-based access. Should the size of the OSV use area decrease over time, the loss of access for public deer hunting could affect the ability to meet deer management objectives; in this event seashore managers would explore options and take actions to manage herd sizes, as appropriate. Should traditional automobile access to all or parts of the island be lost, the complexity of conducting field-based resource management and research would increase with the required shift to water-based modes of transportation.
- **Commercial Services Management**. The scope and complexity of management activities needed to oversee commercial services would increase as shuttle and ferry systems are implemented.
- **Fee Structure and Revenue**. Recreational fees would likely decrease as traditional recreation facilities, infrastructure, and amenities are removed from the island. Access costs to the visitor could, however, include new commercial service fees for accessing the seashore (either the island developed area or backcountry) by ferry or water shuttle when automobile access is lost. Should access for OSV use be lost, the NPS would face a substantial decline in revenue. Otherwise, revenue to the NPS would likely remain relatively static or possibly decline under alternative 4.
- **Staffing**. Approximately six additional full-time equivalent staff would be needed. Staffing needs related to resource management would increase as proactive efforts to enhance resource resiliency in the face of climate change/sea level rise are implemented. The types of staff expertise required

would likely remain relatively constant. Should automobile access to the island be lost, overall staffing needs and/or the types of expertise needed could change due to the decreased efficiency of island operations using water-based access.

- **Administration.** Administrative functions and needs would likely remain relatively constant except that new expertise could be needed to manage the expanded range of commercial services being provided as well as potential for ferry operation.

### 2.7.7 PARTNERSHIPS (ALTERNATIVE 4)

Existing partnerships and cooperative relationships that support ongoing management would continue. Partnership activity with the academic and educational communities would expand with efforts to stimulate research and utilize the seashore as a natural laboratory for learning about the effects of climate change/sea level rise. NPS would collaborate with partners to expand research to improve understanding of aquatic resources, estuarine ecology, and the effects of human activities on water quality, both water-based and in the watershed. As traditional means of access are lost and alternative transportation systems are introduced, partnerships with commercial service providers would likely expand.

### 2.7.8 LAND ACQUISITION (ALTERNATIVE 4)

The NPS would seek to acquire land (up to 25 acres) in the general vicinity of the Maryland headquarters complex sufficient to support the relocation of administrative and maintenance facilities. Relocation of the headquarters complex would make available the existing site as a base of operations for a future alternative transportation system.

Additionally, NPS would support partner groups who seek to acquire various types of legal interests in lands within the Chincoteague Bay watershed for conservation and climate change adaptation purposes (3,000 to 5,000 acres). NPS would collaborate with other federal, state, and county agencies and non-governmental organizations, including the FWS, to protect these lands.

### 2.7.9 SEASHORE BOUNDARY (ALTERNATIVE 4)

NPS would seek an increase in the seashore's authorized ceiling for acquiring interests in land (fee simple and easements) on the mainland in Worcester County, Maryland, for purposes of the following:

- addressing operational and management issues (enabling acquisition of up to 25 acres for relocation of the seashore's headquarters complex and new public access sites for island transportation)

### 2.7.10 EXAMPLES OF ACTIONS NEEDED TO ACHIEVE DESIRED FUTURE CONDITIONS (ALTERNATIVE 4)

Table 2.8 identifies some of the actions needed to move from existing conditions to desired conditions in alternative 4.

### 2.7.11 COSTS (ALTERNATIVE 4)

The NPS has prepared estimates of annual operating costs and one-time costs associated with alternative 4 using NPS and industry cost estimating guidelines (see table 2.11 in section 2.10). Annual recurring costs include personnel and non-labor costs, such as utilities, vehicles, travel, and supplies. One-time capital investments include construction, exhibits, research and planning. These costs are presented for comparative purposes only and will be refined at a later date based upon final design of facilities and other considerations. Some projects have the potential to be funded through partnerships and volunteers, or through shared funding with other agencies. Therefore, actual costs would vary depending on when specific actions are implemented and on contributions by partners and volunteers.

- **NPS Annual Operating Costs and Staffing Requirements**

NPS annual operating costs associated with alternative 4 are estimated to be $6,379,000 (2012 dollars). This includes the anticipated cost for staff salaries and benefits for 48 full-time equivalent (FTE) staff, utilities, supplies, services, and other materials needed for seashore maintenance and operations. The FTE number indicates funded NPS staff only, and does not include volunteer positions, positions funded by partners, or staff hired by NPS with other funds, such as Federal Land Recreation Enhancement Act fees, 54 U.S.C. 101702 funds (commonly referred to as "living exhibits and interpretive demonstrations" fees), special use permit fees, and commercial use authorization funds.

- **One-Time Costs**

Total one-time costs associated with alternative 4 are estimated to be $26,065,867 (2013 dollars) including one-time facilities costs and non-facilities costs. Land acquisition costs and contingency costs are not included.

The NPS share of these one-time costs is estimated at approximately is $24,998,603 (95% of total one-time costs) (2013 dollars). Major facilities costs include those for:

- replace existing administrative offices
- replace existing maintenance facilities
- rehabilitate environmental education center
- entrance station relocation
- land-based alternative transportation system
- boat dock repairs at the former Assateague Beach U.S. Coast Guard Station

Major non-facilities costs include those for:

- enhancing seashore recreation opportunities by restoring island habitats and processes altered by past non-NPS development activities
- relic mosquito ditch restoration
- phragmites control
- saltmarsh restoration

As in alternative 3 total one-time partner costs are estimated at approximately $1,067,264 (5% of total one-time costs) (2013 dollars). Major partner costs include those for:

- road and parking area pavement management projects (FHWA)

**Table 2.8 Alternative 4 – Examples of Actions Needed to Achieve Desired Future Conditions**

| | | Examples of the Types of Actions Needed |
|---|---|---|
| **Seashore-Wide Topics** | **Natural Resource Management** | ▪ expand and diversify partnerships with scientific and educational communities to enhance understanding of resources, appreciation of resources, and resource stewardship, to stimulate research and utilize the seashore as a natural laboratory, and to enhance understanding of the effects of climate change/sea level rise.<br>- |
| | **Cultural Resource Management** | (no actions identified in addition to those common to alternatives 2, 3, and 4) |
| | **Visitor Experience Enhancements** | ▪ expand and diversify partnerships to enhance understanding of resources, appreciation of resources, and resource stewardship:<br>– with commercial service providers to provide seashore access and visitor services (if access is lost)<br>▪ acquire new equipment to support water-based maintenance (contingency action) |
| | **Other Special Studies** | ▪ develop plan for an expanded ATS in the event automobile access is lost, including the potential use of a passenger ferry system with shelters and methods to distribute visitors within developed area (e.g. trails, on-island shuttle system)<br>▪ develop a plan for water-based park maintenance operations to implement in the event automobile access is lost |
| **Development Zone** | **Maryland Island Developed Area** | ▪ minimally maintain existing facilities and infrastructure in place until such time as they are lost, damaged, or become obsolete<br>▪ over time, gradually transition to a day-use area with some opportunities for primitive camping (contingency action)<br>▪ when facilities and infrastructure are lost, damaged, or become obsolete, remove them from island or minimally replace with sustainable designs that support day-use and primitive camping (contingency action)<br>▪ design all new and/or replacement facilities to be compatible with natural coastal processes and the effects of climate change (contingency action)<br>▪ rehabilitate lands and landscape as facilities and infrastructure are removed (contingency action)<br>▪ develop primitive campsites (approximately 150)<br>▪ seek to allow breaches and/or new inlets to evolve naturally, in accordance with the breach management plan<br>▪ when access is lost implement ferry-based ATS operations (island docking facility, wayfinding system, trail improvements) (contingency action)<br>▪ when access is lost implement water-based operations (island docking facility, emergency response)<br>▪ eliminate island maintenance yard (bone yard); restore site |
| | **Maryland Mainland Developed Area** | ▪ relocate park headquarters complex and maintenance facilities (likely to be co-located with new state park facilities) (final decision dependent upon outcome of value analysis)<br>▪ complete rehabilitation of the previous visitor center as a stand-alone environmental education center<br>▪ when access is lost:<br>- implement plan for an expanded ATS including development of a ferry terminal facility and ferry terminal parking (contingency action)<br>- implement plan for water-based park maintenance operations, including development of a mainland docking facility (contingency action)<br>▪ acquire up to 25 acres in the general vicinity of the Maryland headquarters complex sufficient to support the relocation of administrative and maintenance facilities<br>▪ support partner groups who seek to acquire various types of legal interests in lands within the Chincoteague Bay watershed for conservation and climate change adaptation purposes |
| | **Virginia Assigned Area Subzone** | (no actions identified in addition to those common to all, as listed in table 2.5 above) |

**Table 2.8 Alternative 4 – Examples of Actions Needed to Achieve Desired Future Conditions (continued)**

| | | Examples of the Types of Actions Needed |
|---|---|---|
| **Natural Resource Zone** | **Primary Zone** | ▪ expand long-term monitoring efforts to include key climate drivers<br>▪ support cooperative research efforts to better understand the effects of climate change and to develop adaption strategies<br>▪ identify resources vulnerable to the effects of climate change and work to enhance resiliency<br>▪ enhance and expand outreach and education programs focused on climate change adaptation<br>▪ expand use of seashore as a natural laboratory<br>▪ prohibit access to the north end to limit resource impacts |
| | **Active Beach Recreation Sub Zone** | ▪ continue to allow OSV use in the existing areas until access is lost (if the breach management plan recommends that the breach remain closed)<br>▪ should vehicle access be lost, convert inaccessible areas to resource preservation sub zone |
| | **Resource Preservation Sub Zone** | ▪ with respect to the potential and proposed wilderness, undertake an assessment of eligibility and a new wilderness study that addresses:<br>- consider moving the eastern boundary of the proposed wilderness area westward from the mean high water line of the Atlantic Ocean to a line approximately 50 feet west of the ocean beach winter storm berm<br>- consider establishing an administrative area within the vicinity of Green Run Bay, to include the Green Run backcountry campsite, the former Green Run Hunting Lodge property, and the associated access road<br>- consider establishing two administrative corridors around the existing Fox Hills and Big Levels public cross island bayside access sand roads |
| **Cultural Resource Zone** | **Primary Zone** | ▪ at the former Assateague Beach U.S. Coast Guard Station:<br>- continue to maintain resources subject to availability of funding (including repairs to boat dock and replacement of electric services) until no longer sustainable in the context of natural coastal processes and/or the effects of climate change/sea level rise, pending the outcome of a value analysis after each storm event<br>- implement limited actions to protect resources at the Coast Guard Station to protect resources from natural coastal processes and /or effects of climate change/sea level rise<br>▪ at the former Green Run Lodge:<br>- rehabilitate and adaptively reuse the lodge to provide a contact station for one of the new backcountry to bay island access points<br>- protect and maintain the lodge in situ until no longer sustainable in the context of natural coastal processes and/or the effects of climate change, pending the outcome of a value analysis after each storm event<br>- maintain boat access for visitors to the backcountry |
| **Central Chincoteague Bay** | **Primary Zone** | ▪ expand and support collaboration with partners to better understand, monitor and protect estuarine resources<br>▪ encourage the state of Maryland to establish an oyster sanctuary, if feasible<br>▪ initiate an assessment of privately owned structures (e.g. oyster watch houses and duck blinds) located within the seashore's Virginia waters to determine their legal status; pursue removal of any unauthorized structures<br>▪ work with Virginia and Accomack County to ensure appropriate wastewater treatment and disposal at authorized structures (e.g. oyster watch houses)<br>▪ enact public use closures as needed to protect marine mammal concentration areas and colonial waterbird breeding sites |
| **Sinepuxent and Southern Chincoteague Bay** | **Primary Zone** | ▪ expand and support collaboration with partners to better understand, monitor and protect estuarine resources<br>▪ encourage the state of Maryland to establish an oyster sanctuary, if feasible<br>▪ initiate an assessment of privately owned structures (e.g. oyster watch houses and duck blinds) located within the seashore's Virginia waters to determine their legal status; pursue removal of any unauthorized structures<br>▪ work with Virginia and Accomack County to ensure appropriate wastewater treatment and disposal at authorized structures (e.g. oyster watch houses) |
| **Atlantic Ocean** | **Primary Zone** | ▪ work with and support partners to better understand, monitor and protect marine resources |

## 2.8 Indicators and Standards

User capacity is one statutory requirement for GMPs established in the 1978 National Parks and Recreation Act (54 U.S.C. 100502). The act called for the identification of and implementation commitments for visitor carrying capacities. The *NPS GMP Sourcebook* (2008) explains that planners have found that user capacity is a more appropriate term than visitor carrying capacity because it conveys the concept that capacity is applicable to all seashore users, including local residents. The NPS defines user capacity as the type and level of use that can be accommodated while sustaining the desired resource conditions, social conditions, and visitor experiences consistent with the purposes of the park. The approach to user capacity is now focused on measuring the success at achieving and maintaining desired resource conditions and visitor experiences as affected by people's use of the parks. The NPS does not solely track and control user numbers, but instead manages the levels, types, behaviors, and patterns of visitor use and other public uses as needed to control the condition of the resources and the quality of the visitor experiences. The planning process requires the development of a monitoring system to test the effectiveness of the management actions taken by identifying indicators and standards which gauge when or if the desired conditions have been achieved.

The user capacity decision making process can be summarized by the following major planning and management steps:

- establish desired conditions for resources, visitor experiences, and general levels of management, development, and access for different areas of the park
- identify indicators and standards to measure success at achieving desired conditions
- monitor existing conditions in relation to indicators and standards
- implement appropriate management actions to maintain or restore desired conditions and assess the effects of those actions taken

GMPs now include a general description of how indicators and standards will be monitored (to ensure they are feasible). The development of specific monitoring protocols is left to a detailed monitoring plan, which is beyond the scope of the GMP. The indicators and standards could require modification if new knowledge is gained about the efficacy of those selected during the planning process.

Based on some of the most pressing existing or potential use concerns at the seashore, the NPS has identified a set of indicators and standards for each management zone (table 2.9). Monitoring actions are recommended for purposes of collecting data needed to assess whether standards are met over time (table 2.9).

**Table 2.9 Indicators and Standards**

| Zone | | Indicator | Standard | Monitoring |
|---|---|---|---|---|
| Development | **Primary Zone** | 1 Crowding - Number of vehicles in any parking area versus the number of designated parking spaces<br>2 Impervious Surfaces - Overall acreage of impervious surfaces (roads, parking lots, roof surfaces, etc.) | 1 Number of days between May and September where the number of vehicles in any parking area exceeds the number of designated parking spaces decreases by an average of 1% per year from baseline<br>2 Number of acres of impervious surfaces decreases by an average of 0.1% per year from baseline | 1 Automated vehicle counters and routine observations by field staff; analyzed every 5 years<br>2 Periodic assessments of impervious surfaces using combination of aerial photography and field surveys; GIS analysis every 5 years |
| | **Virginia Assigned Area Subzone** | 1 Facilities – Damage to visitor use facilities from coastal storms | 1 Cost of repairing damages to visitor use facilities from coastal storms decreases by an average of 10% per year from baseline | 1 Annual assessment of damage repair costs; analyzed every 5 years |
| Natural Resource | **Primary Zone** | 1 Natural Coastal Processes – Cubic yards of sediment bypassed to north end annually as mitigation for impacts to sediment budget from Ocean City Inlet<br>2 Crowding - Ability to camp in backcountry out of sight and sound of other parties | 1 140,000-175,000 yards$^3$ of sediment bypassed to north end annually as mitigation for impacts to sediment budget from Ocean City Inlet<br>2 80% or more of backcountry campers are out of sight and sound of other parties | 1 Monitoring of North end restoration sand by-passing program; analyzed every 5 years<br>2 Annual assessment of backcountry camping permits; analyzed every 5 years |
| | **Active Beach Recreation Subzone** | 1 Delays – Percentage of OSV permit holders who experience 5 or more delays per year entering the OSV use area<br>2 Sensitive Species – Number of violations of public use area closures | 1 Less than 15% percent of OSV permit holders experience 5 or more delays per year in entering the OSV use area<br>2 Number of violations of public use area closures decreases by an average of 1% per year from baseline | 1 Periodic surveys to assess visitor experience and satisfaction with OSV use; analyzed every 5 years<br>2 Annual monitoring of area closure violations during summer reference period; analyzed every 5 years |
| | **Resource Preservation Subzone** | 1 Natural Resource Preservation/Rehabilitation - Percentage of lands within the subzone impacted by non-native invasive plants, anthropogenic features, landscape modifications, or incompatible activities<br>2 Crowding - Percentage of backcountry campers who consider overcrowding to be a problem | 1 Number of impacted acres decreases by an average of 1% per year from baseline<br>2 Less than 15% percent of backcountry campers consider overcrowding to be a problem | 1 Periodic assessments to determine impacts and the extent of affected areas, coupled with documentation of restoration activities; GIS analysis every 5 years<br>2 Periodic surveys to assess visitor experience and satisfaction with backcountry conditions; analyzed every 5 years |

**Table 2.9 Indicators and Standards (continued)**

| Zone | | Indicator | Standard | Monitoring |
|---|---|---|---|---|
| **Cultural** | **Primary Zone** | 1 Resource Condition – Percentage of cultural resources (landscapes, archeological sites, historic structures, museum objects) in good condition | 1 Percentage of cultural resources (landscapes, archeological sites, historic structures, museum objects) in good condition increases by an average of 5% per year from baseline | 1 Periodic condition surveys by cultural resource experts; analyzed every 5 years |
| **Central Chincoteague Bay** | **Primary Zone** | 1 Water Quality - Degree of degradation as measured by four parameters (total nitrogen, total phosphorus, chlorophyll a, and dissolved oxygen) compared to biologically relevant thresholds established for the maintenance of sea grass and fish communities<br>2 User Conflicts – Percentage of non-motorized boaters who experience conflicts with motorized vessels | 1 Meets sea grass and living resource objectives:<br>– Median TN , Jan-Dec, 0.56-0.64 milligrams/Liter<br>– Median TP, Jan-Dec, 0.026-0.037 milligrams/Liter<br>– Median Chla, Mar-Nov, 7.5-15 micrograms/Liter<br>– Median DO, Jun-Sep, 6-7 milligrams/Liter<br>2 Less than 1% percent of non-motorized boaters experience conflicts with motorized vessels | 1 Monthly water quality sampling for required parameters at sites in Sinepuxent and Chincoteague Bays; analyzed annually<br>2 Periodic surveys to assess visitor experience and satisfaction with backcountry conditions; analyzed every 5 years |
| **Sinepuxent and Southern Chincoteague Bay** | **Primary Zone** | 1 Water Quality - Degree of degradation as measured by four parameters (total nitrogen, total phosphorus, chlorophyll a, and dissolved oxygen) compared to biologically relevant thresholds established for the maintenance of sea grass and fish communities<br>2 User Conflicts – Percentage of non-motorized boaters who experience conflicts with motorized vessels | 1 Meets sea grass and living resource objectives:<br>– Median TN , Jan-Dec, 0.56-0.64 milligrams/Liter<br>– Median TP, Jan-Dec, 0.026-0.037 milligrams/Liter<br>– Median Chla, Mar-Nov, 7.5-15 micrograms/Liter<br>– Median DO, Jun-Sep, 6-7 milligrams/Liter<br>2 Less than 5% percent of non-motorized boaters experience conflicts with motorized vessels | 1 Monthly water quality sampling for required parameters at sites in Sinepuxent and Chincoteague Bays; analyzed annually<br>2 Periodic surveys to assess visitor experience and satisfaction with backcountry conditions; analyzed every 5 years |
| **Atlantic Ocean** | **Primary Zone** | 1 Water Quality - Degree of degradation as measured by EPA-recommended bacterial indicator for marine waters during primary swimming season (May through September)<br>2 Aesthetic Conditions - Impacts to ocean viewshed from the presence of permanent manmade structures or features | 1 Meets EPA marine beach water quality 30-day geometric mean standard and single sample maximum standard<br>2 No permanent manmade structures or features within viewshed of island (does not include land-based features) | 1 Weekly sampling at lifeguard protected swim beaches during primary swimming season (May-September); analyzed annually<br>2 Continuous monitoring of ocean development proposals |

## 2.9 Mitigation Measures Included the Alternatives

Table 2.10 summarizes the mitigation measures and best management practices that would generally be applied to avoid or minimize potential impacts from implementing future management actions in the alternatives. In addition, some actions may require additional site-specific planning and compliance which would be done at the time the action is implemented.

**Table 2.10 Mitigation Measures included in the Alternatives**

| Topic | Mitigation Measure |
|---|---|
| **Water Resources** | • During construction use erosion control measures, minimize discharge to water bodies, and regularly inspect construction equipment for leaks of petroleum and other chemicals.<br>• Minimize use of heavy equipment in waterways.<br>• Educate visitors regarding potential resource impacts associated with boating in shallow waters. |
| **Wetlands** | • Delineate wetlands by qualified NPS staff or certified wetland specialists and clearly mark the wetlands before construction work.<br>• Avoid to the extent practicable adverse impacts to wetlands; minimize any impacts to wetlands that cannot be avoided.<br>• Perform construction activities in a cautious manner to prevent damage caused by equipment, erosion, siltation, etc. |
| Soils | • Minimize soil erosion by limiting the time that soil is left exposed and by applying other erosion control measures, such as erosion matting, silt fencing, and sedimentation basins in construction areas to reduce erosion, surface scouring, and discharge to water bodies.<br>• Once work is completed, revegetate construction areas with native plants in a timely period. |
| **Nonnative (Exotic) Species** | • Implement a noxious weed control program for construction sites Standard measures could include the following elements:<br>- ensure construction-related equipment arrives on-site free of mud or seed-bearing material<br>- certify all seeds and straw material are weed-free<br>- identify areas of noxious weeds pre-construction<br>- treat noxious weeds or noxious weed topsoil before construction (e.g. topsoil segregation, storage, herbicide treatment)<br>- revegetate with appropriate native species |
| **Threatened or Endangered Species and Species of Concern** | • Mitigation actions would occur during normal seashore operations as well as before, during, and after construction to minimize immediate and long-term impacts on rare, threatened, and endangered species. These actions would be specific to the project and area of the seashore affected, and additional mitigation would be added depending on the specific action and location. Many of the measures listed below for vegetation and wildlife would also benefit rare, threatened, and endangered species by helping to preserve habitat.<br>• Mitigation actions specific to rare, threatened, and endangered species would include:<br>- conduct surveys for rare, threatened, and endangered species as warranted<br>- locate and design facilities/actions to avoid adverse effects on rare, threatened, and endangered species and their habitats – if avoidance is infeasible, minimize and compensate for adverse effects on rare, threatened, and endangered species as appropriate and in consultation with the appropriate resource agencies - conduct work outside of critical periods for the specific species.<br>- develop and implement restoration and/or monitoring plans as warranted – plans should include methods for implementation, performance standards, monitoring |

**Table 2.10 Mitigation Measures included in the Alternatives (continued)**

| Topic | Mitigation Measure |
|---|---|
| | criteria, and adaptive management techniques<br>- implement measures to reduce adverse effects of non-native plants and wildlife on rare, threatened, and endangered species |
| **Vegetation** | • Monitor areas used by visitors (e.g. trails) for signs of native vegetation disturbance.<br>• Use public education, native plants to revegetate disturbed areas, erosion control measures, and barriers to control potential impacts on plants from visitor use.<br>• Use barriers and closures to prevent trampling and loss of sensitive vegetation.<br>• Develop revegetation plans for disturbed areas and require use of native species. Revegetation plans should specify seed/plant source, seed/plant mixes, soil preparation, etc. Salvage vegetation should be used to the extent possible. |
| **Wildlife** | • Employ techniques to reduce impacts on wildlife, including visitor education programs, restrictions on visitor activities, and seashore ranger patrols.<br>• Continue implementation of natural resource protection programs. Standard measures would include avoidance of sensitive wildlife habitats, construction scheduling, biological monitoring, erosion and sediment control, use of fencing or other means to protect sensitive resources adjacent to construction, the removal of all food-related items or rubbish, topsoil salvage, and revegetation. This could include construction monitoring by resource specialists as well as treatment and reporting procedures. |
| **Air Quality** | • Implement a dust abatement program for construction sites. Standard dust abatement measures could include the following elements: water or otherwise stabilize soils, cover haul trucks, employ speed limits on unpaved roads, minimize vegetation clearing, and revegetate after construction.<br>• Reduce greenhouse gas emissions to the extent practicable. |
| **Hazardous Materials** | • Implement a spill prevention and pollution control program for hazardous materials. Standard measures could include:<br>– hazardous materials storage and handling procedures<br>– spill containment, cleanup, and reporting procedures;<br>– limitation of refueling and other hazardous activities to upland/non-sensitive sites |
| **Soundscape** | • Implement standard noise abatement measures during seashore operations and construction. Standard noise abatement measures could include the following elements:<br>– a schedule that minimizes impacts on adjacent noise-sensitive uses<br>– use of the best available noise control techniques wherever feasible<br>– use of hydraulically or electrically powered impact tools when feasible<br>– location of stationary noise sources as far from sensitive uses as possible<br>• Site and design facilities to minimize objectionable noise.<br>• Explore options to reduce the sounds of maintenance equipment. |
| **Night Skies** | • Restrict use of artificial lighting to those areas where security, basic human safety, and specific cultural resource requirements must be met.<br>• Use minimal-impact lighting techniques including shielded light fixtures to prevent light spill over and use of low-intensity lights.<br>• Shield artificial lighted to prevent disruption of the night sky, physiological processes of living organisms, and other natural processes.<br>• Seek the cooperation of park visitors, neighbors, and local government agencies to prevent or minimize the intrusion of artificial light into the night scene of the seashore's ecosystem. |
| **Cultural Resources** | • Continue to develop inventories for and oversee research about archeological, historic, and ethnographic resources to better understand and manage cultural resources, including historic and ethnographic cultural landscapes. Conduct any needed archeological or other resource specific surveys, prepare national register evaluations, and identify recommended treatments. Incorporate the results of these efforts into the |

**Table 2.10 Mitigation Measures included in the Alternatives (continued)**

| Topic | Mitigation Measure |
|---|---|
| **Cultural Resources (cont.)** | seashore's resource stewardship strategy and site-specific planning and compliance documents.<br>• Locate projects in previously disturbed or existing developed areas to avoid or minimize adverse impacts to archeological resources. Use screening and/or sensitive design that would be compatible with historic resources and cultural landscapes and avoid development adjacent to ethnographic resources. If adverse impacts could not be avoided, these impacts would be mitigated by strategies determined through a consultation process with all interested parties.<br>• Conduct archeological site monitoring and routine protection. Conduct data recovery excavations at archeological sites threatened with destruction, where protection or site avoidance during design and construction is infeasible. Strictly adhere to NPS standards and guidelines on the display and care of artifacts. This would include artifacts used in exhibits in the visitor center.<br>• Mitigating measures for structures and landscapes might include documentation according to standards of the Historic American Buildings Survey/Historic American Engineering Record/Historic American Landscape Survey (HABS/HAER/HALS) and in accordance with the Secretary's Standards and Guidelines for Historical and Archaeological Documentation. The level of this documentation, which includes photography, archeological data recovery, and/or a narrative history, would depend on significance (national, state, or local) and individual attributes (an individually significant structure, individual elements of a cultural landscape, etc.) and be determined in consultation with the state historic preservation officer, tribal historic preservation officer(s), local community (ies), and/or other interested parties. When demolition of a historic structure is proposed, and following thorough documentation, architectural elements, and objects may be salvaged for reuse in rehabilitating similar structures, or they may be added to the seashore's museum collection. In addition, the historical alteration of the human environment and reasons for that alteration could be interpreted to visitors.<br>• Consult with culturally associated groups and American Indian tribes, when appropriate.<br>• Encourage visitors through the seashore's interpretive programs, to respect and leave undisturbed any inadvertently encountered archeological resources |
| **Visitor Safety and Experience** | • Implement traffic control measures, as warranted to maintain safe and efficient traffic flow.<br>• Implement measures to reduce adverse effects of construction on visitor safety and experience. |

## 2.10 Cost Comparison

### 2.10.1 ESTIMATED COSTS FOR IMPLEMENTING THE PLAN

Table 2.11 presents a summary of the annual operating and one-time costs for the four alternatives. The cost figures are provided here and throughout the plan only to provide an estimate of the relative costs of the alternatives. The following statements apply to the cost estimates:

- the costs are presented as estimates (in 2013 dollars) and are not appropriate for budgeting purposes
- the estimates presented have been developed using NPS and industry standards to the extent available
- specific costs will be determined at a later date, considering the design of facilities, identification of detailed resource protection needs, and changing visitor expectations
- actual costs to the NPS will vary depending on when the actions are implemented, and on contributions by partners and volunteers
- approval of the GMP/EIS does not guarantee that funding or staffing for proposed actions will be available
- the implementation of the approved plan, no matter which alternative is selected, will depend on future NPS funding levels and service-wide priorities, and on partnership funds, time, and effort

### 2.10.2 FUNDING FOR ACTIONS IDENTIFIED IN THE PLAN

The NPS develops 5-year deferred maintenance and capital improvement plans. These plans are developed by a systematic process of evaluating proposals from the field to determine which projects are of greatest need in priority order focusing on critical health and safety issues and critical resource protection requirements. Actions that add specific projects to the 5-year plans inevitably result in other projects being displaced when budgets are limited.

Capital development, maintenance, and staffing proposals in this Draft GMP/EIS would be evaluated in light of competing priorities for Assateague Island National Seashore and other units of the national park system. Because emphasis in the budget process is currently placed on addressing needs to maintain existing infrastructure, funding for new development is not likely within the next five years. However, the potential for implementing development and operational proposals in this plan may be improved if funding is available from partnerships that do not rely on the NPS's budget.

Assateague Island National Seashore exists entirely within the coastal plain of the states of Maryland and Virginia. All of the seashore's visitor facilities and operations facilities are all vulnerable to future sea-level rise and storm surges. The action alternatives propose a number of facility-related actions to address a variety of visitor and

infrastructure needs under different scenarios. The NPS will evaluate proposed facility investments prior to project approvals using the best scientific information available and the climate change strategies described above to ensure the long-term sustainability of these investments. Due to the seashore's location and potential vulnerabilities, it is possible that the NPS may conclude that such financial investments for facilities would be unwise and that other options would be considered or that the proposed project would not be implemented at all.

**Table 2.11 Alternatives Cost Comparison**

| Subject | Alternative 1 | Alternative 2 | Alternative 3 (NPS Preferred) | Alternative 4 |
|---|---|---|---|---|
| **NPS Annual Operating Costs[1] ($2012)** | **$ 5,255,000** | **$ 6,058,000** | **$ 6,364,000** | **$ 6,379,000** |
| **NPS Staffing – FTE[2]** | **41** | **45.5** | **47** | **47** |
| **Total One-Time NPS Costs[3] ($2013)** | **$ 25,028,077** | **$ 52,979,557** | **$ 27,432,624** | **$ 24,998,603** |
| NPS Facility Costs[4] | $ 21,320,406 | $ 48,069,220 | $ 21,669,954 | $ 19,664,226 |
| NPS Non-Facility Costs[5] | $ 3,707,670 | $ 4,910,337 | $ 5,762,670 | $ 5,354,337 |
| **Partner Costs ($2013)** | **$ 4,120,083** | **$ 18,967,264** | **$ 1,067,264** | **$ 1,067,264** |
| Transportation System | $ 4,120,083 | $ 1,067,264 | $ 1,067,264 | $ 1,067,264 |
| Beach Nourishment | $ - | $ 17,900,000 | $ - | $ - |
| Other Projects | $ - | $ - | $ - | $ - |

1. NPS annual operating costs are the total NPS costs per year for maintenance and operations associated with each alternative, including: utilities, supplies, staff salaries and benefits, services, and other materials. Cost and staffing estimates assume the alternative is fully implemented as described in sections 2.3, 2.5, 2.6, and 2.7.
2. The total number of full-time equivalents (FTE) is the number of NPS person-years of staff required to maintain the assets of the seashore at a good level, provide acceptable visitor services, protect resources, and generally support the seashore's operations. The FTE number indicates funded NPS staff only, and does not include volunteer positions, positions funded by partners, or staff hired by NPS with other funds, such as Federal Land Recreation Enhancement Act fees, 54 U.S.C. 101702 funds (commonly referred to as "living exhibits and interpretive demonstrations" fees), special use permit fees, and commercial use authorization funds.
3. The general duties of existing and proposed staff are described for each alternative in sections 2.3.6, 2.5.6, 2.6.6, and 2.7.6.
4. Total one-time NPS costs equal the sum of facility costs, non-facility costs, and other costs.
5. One-time NPS facility costs include those for design, construction, rehabilitation, or adaptive reuse of NPS facilities, including visitor centers, roads, parking areas, administrative facilities, comfort stations, educational facilities, entrance stations, maintenance facilities, and other visitor facilities. These are described for each alternative in sections 2.3.3, 2.4.3 (common to all), 2.5.3, 2.6.3, and 2.7.3.
6. One-time NPS non-facility costs include those for the preservation of cultural or natural resources not related to facilities, the development of visitor use tools not related to facilities, and other seashore management activities that would require substantial funding the seashore annual operating costs. These are described for each alternative in sections 2.3, 2.4 (common to all), 2.5, 2.6 and 2.7.

## 2.11 Comparison of Alternatives

**Table 2.12 Comparison of Alternatives – Maryland District**

| Subject | Alternative 1 | Alternative 2 | Alternative 3 (NPS Preferred) | Alternative 4 |
|---|---|---|---|---|
| **Response to Natural Coastal Processes and Effects of Climate Change/Sea Level Rise (in MD)** | ▪ repair/replacement of facilities damaged by storms at or near their current location, if funding is available | ▪ island developed area fortification to protect it from threats, as long as suitable land base exists and funding is available | ▪ climate change adaptation, letting the island evolve naturally and relocating/designing new facilities to be more sustainable | ▪ natural island evolution without interference, maintaining facilities only until they are lost, severely damaged, or become obsolete |
| | ▪ response to breaches and/or new inlet formation is uncertain | ▪ breach management protocol generally supports closing and/or mitigating breaches and/or new inlets in the island developed area | ▪ breach management protocol seeks a balance that allows breaches and/or new inlets to generally evolve naturally while considering human safety and protection of property | ▪ breach management protocol seeks to allow breaches and/or new inlets in the island to evolve naturally |
| **Visitor Use and Experience (in MD)** | ▪ focus on traditional beach recreation as long as access is maintained and facilities are sustained given available funds | ▪ focus on traditional beach recreation within a high density visitor use area; recreation use would become concentrated within a smaller space, increasing crowding and potentially lead-ing to visitor use limits and increased fees | ▪ focus on traditional beach recreation; over time facilities supporting uses would likely move to new, more sustainable locations both on and off the island; some recreation activities relocated to the mainland | ▪ focus on traditional beach recreation; over time shift to increasingly primitive day-use only experiences; some recreation activities eliminated |
| **Oversand Vehicle Use (in MD)** | ▪ no change to OSV use area | ▪ smaller OSV use area (KM 16 to KM23); if access lost, no action would be taken, resulting in further reduction of OSV use area | ▪ no change to OSV use area (KM 16 to KM 35); if access lost, the OSV use area might be modified or relocated | ▪ no change to OSV use area (KM 16 to KM 35); if access lost, no action would be taken, resulting in further reduction of OSV use area |
| **Hunting (in MD)** | ▪ hunting continues subject to annual or biannual hunting plan; access could become more difficult | ▪ hunting continues subject to annual or biannual hunting plan; access could become more difficult | ▪ hunting continues subject to annual or biannual hunting plan; access could become more difficult | ▪ hunting continues subject to annual or biannual hunting plan; access could become more difficult |
| **Seashore Access (short-term) (in MD)** | ▪ private vehicle; peak-day demand for park-ing exceeds capacity | ▪ private vehicle; shuttle access once parking capacity is reached | ▪ vehicle limits would be set based on parking lot capacity; eventually shuttle access would be developed | ▪ vehicle limits would be set based on parking lot capacity; eventually shuttle access would be developed |

**Table 2.12 Comparison of Alternatives – Maryland District (continued)**

| Subject | Alternative 1 | Alternative 2 | Alternative 3 (NPS Preferred) | Alternative 4 |
|---|---|---|---|---|
| **Seashore Access (long-term) (in MD)** | ▪ no planning for potential loss of bridge access; seashore could | ▪ no planning for potential loss of bridge access; seashore could | ▪ if bridge access is lost, access would transition to all water | ▪ if bridge access is lost, access would transition to all water |
| **Seashore Access (long-term) (cont.) (in MD)** | ▪ become inaccessible for months to years following major storm events | ▪ become inaccessible for months to years following major storm events | ▪ access via new passenger ferry service (with an island shuttle to the beach) and an enhanced network of mainland public access sites | ▪ access via new passenger ferry service and by commercial service providers operating from existing mainland public access sites |
| **Seashore Facilities and Operations (in MD)** | ▪ miscellaneous repairs to park headquarters complex | ▪ rehabilitated administrative and maintenance facilities on the mainland<br>▪ with MD DNR, explore consolidation of entrance stations on the mainland | ▪ new administrative and maintenance facilities at a new mainland site in partnership with state park<br>▪ with MD DNR, explore consolidation of entrance stations on the mainland | ▪ new administrative and maintenance facilities at a new mainland site in partnership with state park<br>▪ with MD DNR, explore consolidation of entrance stations on the mainland |
| **Natural Resource Management (in MD)** | ▪ management continues to focus on:<br>- protecting sensitive species<br>- monitoring resource conditions<br>- mitigating external threats<br>- controlling non-native species<br>- restoring habitats impacted by man | ▪ some management programs diminish as resources are re-directed to protection of recreation opportunities | ▪ programs expand and the scope of some programs changes to address issues created by global climate change | ▪ programs expand and the scope of some programs changes to address mitigation of human impacts and climate change adaptation<br>▪ expanded cooperative research including more basic science and barrier island ecology research |
| **Marine Resource Management (MD)** | ▪ the state of Maryland would continue to manage shellfishing within the seashore<br>▪ commercial aquaculture is not present and would | ▪ work collaboratively to better understand the natural and cultural resources within the marine areas of the seashore<br>▪ the state of Maryland would continue to manage shellfishing within the seashore<br>▪ commercial aquaculture is not present and would | ▪ work collaboratively to better understand the natural and cultural resources within the marine areas of the seashore<br>▪ the state of Maryland would continue to manage shellfishing within the seashore<br>▪ commercial aquaculture is not present and would | ▪ work collaboratively to better understand the natural and cultural resources within the marine areas of the seashore<br>▪ the state of Maryland would continue to manage shellfishing within the seashore<br>▪ commercial aquaculture is not present and would |

**Table 2.12 Comparison of Alternatives – Maryland District (continued)**

| Subject | Alternative 1 | Alternative 2 | Alternative 3 (NPS Preferred) | Alternative 4 |
|---|---|---|---|---|
| | continue to be discouraged in MD<br>▪ continue to not enforce existing prohibition on unauthorized commercial harvest of finfish and horseshoe crabs | ▪ continue to be discouraged in MD<br>▪ prohibit harvest of horseshoe crabs as currently proposed by the USFWS' final *Comprehensive Conservation Plan*<br>▪ collaborate with local and regional cultural and academic institutions to develop interpretive programming and other visitor information that would illuminate the cultural heritage of the eastern shore and Assateague Island | continue to be discouraged in MD<br>▪ prohibit harvest of horseshoe crabs as currently proposed by the USFWS' final *Comprehensive Conservation Plan*<br>▪ collaborate with local and regional cultural and academic institutions to develop interpretive programming and other visitor information that would illuminate the cultural heritage of the eastern shore and Assateague Island | continue to be discouraged in MD<br>▪ prohibit harvest of horseshoe crabs as currently proposed by the USFWS' final *Comprehensive Conservation Plan*<br>▪ collaborate with local and regional cultural and academic institutions to develop interpretive programming and other visitor information that would illuminate the cultural heritage of the eastern shore and Assateague Island |
| **Wilderness (in MD)** | ▪ no change in the size or location of potential and recommended wilderness | ▪ undertake an assessment of wilderness eligibility and prepare a new wilderness study<br>▪ no change in the size or location of potential and recommended wilderness | ▪ undertake an assessment of wilderness eligibility and prepare a new wilderness study<br>▪ scope of the proposed wilderness study would consider:<br>- moving eastern boundary to the west to allow OSV use on the beach below the winter storm berm<br>- establishing an administrative area near Green Run Lodge and associated access road<br>- establishing two administrative access corridors | ▪ undertake an assessment of wilderness eligibility and prepare a new wilderness study<br>▪ scope of the proposed wilderness study would consider:<br>- moving eastern boundary to the west to allow OSV use on the beach below the winter storm berm<br>- establishing an administrative area near Green Run Lodge and associated access road<br>- establishing two administrative access corridors |

**Table 2.12 Comparison of Alternatives – Maryland District (continued)**

| Subject | Alternative 1 | Alternative 2 | Alternative 3 (NPS Preferred) | Alternative 4 |
|---|---|---|---|---|
| **Cultural Resource Management (in MD)** | ▪ no adaptive reuse of former Green Run | ▪ no adaptive reuse of former Green Run Lodge; no action to protect site from effects of natural coastal processes and/or climate change | ▪ adaptive reuse as a visitor contact station; possible structural storm protection in conjunction with dock development for a new bayside back-country access site | ▪ adaptive reuse as a visitor contact station; possible structural storm protection in conjunction with dock development for a new bayside back-country access site |
| **Partnerships (in MD)** | | ▪ Expanded/new partnerships with:<br>- USACE<br>- additional commercial service providers | ▪ Expanded/new partnerships with:<br>- Assateague State Park<br>- additional commercial service providers<br>- scientific and educational communities<br>- Worcester County and adjacent landowners on the mainland | ▪ Expanded/new partnerships with:<br>- Assateague State Park<br>- additional commercial service providers<br>- scientific and educational communities |
| **Land Acquisition (in MD)** | | ▪ acquisition of 10 acres in vicinity of Maryland HQ complex for development of alternative transportation system | acquisition of from 20 to 200 acres for relocation of administrative and maintenance facilities, some island facilities, and transportation infrastructure (amount of land acquisition would vary depending upon degree of collaboration with MD DNR and whether existing state-owned property could be used)<br><br>▪ support for partner and/or direct NPS development of one to three points of departure on the mainland for mid-island access (150 to 200 acres) | ▪ acquisition of up to 25 acres for relocation of Maryland HQ complex (amount of land acquisition would vary depending upon degree of collaboration with MDDNR and whether existing state-owned property could be used) |

**Table 2.12 Comparison of Alternatives – Maryland District (continued)**

| Subject | Alternative 1 | Alternative 2 | Alternative 3 (NPS Preferred) | Alternative 4 |
|---|---|---|---|---|
| | | | ▪ support partner groups who seek to acquire various types of legal interests in lands within the Chincoteague Bay watershed for conservation and climate change adaptation purpose | ▪ support partner groups who seek to acquire various types of legal interests in lands within the Chincoteague Bay watershed for conservation and climate change adaptation purpose |
| **Seashore Boundary (in MD)** | | ▪ seek an increase in the seashore's authorized ceiling for acquiring interests in land (fee simple and easements) on the mainland in Worcester County, Maryland, including:<br>- for facilities – approximately 10 acres | ▪ seek an increase in the seashore's authorized ceiling for acquiring interests in land (fee simple and easements) on the mainland in Worcester County, Maryland, including:<br>- for facilities – from 170 to 400 acres, depending upon potential collaboration with MD DNR and NPS land conservation partners | ▪ seek an increase in the seashore's authorized ceiling for acquiring interests in land (fee simple and easements) on the mainland in Worcester County, Maryland, including:<br>- for facilities – approximately 25 acres |

**Table 2.13 Comparison of Alternatives – Virginia District**

| Subject | Alternative 1 | Alternative 2 | Alternative 3 (NPS Preferred) | Alternative 4 |
|---|---|---|---|---|
| **Visitor Use and Visitor Experience (in VA)** | ▪ continue to provide opportunities for beach recreation, a lifeguarded beach, interpretive services, and visitor and resource protection at locations determined by FWS | ▪ same as alternative 1 | ▪ same as alternative 1 | ▪ same as alternative 1 |
| **Oversand Vehicle (OSV) Use (in VA)** | ▪ as determined by the U.S. FWS | ▪ same as alternative 1 | ▪ same as alternative 1 | ▪ same as alternative 1 |
| **Marine Resource Management** | | ▪ work collaboratively to better understand the natural and cultural resources within the marine areas of the seashore | ▪ work collaboratively to better understand the natural and cultural resources within the marine areas of the seashore | ▪ work collaboratively to better understand the natural and cultural resources within the marine areas of the seashore |
| | ▪ the commonwealth of Virginia would continue to manage shellfishing within the seashore | ▪ the commonwealth of Virginia would continue to manage shellfishing within the seashore | ▪ the commonwealth of Virginia would continue to manage shellfishing within the seashore | ▪ the commonwealth of Virginia would continue to manage shellfishing within the seashore |
| | ▪ commercial aquaculture leasing would continue in Virginia | ▪ issue a special use permit under 36 CFR 2.60(3)b to the VMRC within the commonwealth of Virginia to allow for the continued practice of commercial aquaculture and maintenance of the historic setting | ▪ issue a special use permit under 36 CFR 2.60(3)b to the VMRC within the commonwealth of Virginia to allow for the continued practice of commercial aquaculture and maintenance of the historic setting | ▪ issue a special use permit under 36 CFR 2.60(3)b to the VMRC within the commonwealth of Virginia to allow for the continued practice of commercial aquaculture and maintenance of the historic setting |
| | ▪ continue to not enforce existing prohibition on unauthorized commercial harvest of finfish and horseshoe crabs | ▪ prohibit harvest of horseshoe crabs as currently proposed by the USFWS' final *Comprehensive Conservation Plan* | ▪ prohibit harvest of horseshoe crabs as currently proposed by the USFWS' final *Comprehensive Conservation Plan* | ▪ prohibit harvest of horseshoe crabs as currently proposed by the USFWS' final *Comprehensive Conservation Plan* |
| | | ▪ collaborate with local and regional cultural and academic institutions to develop interpretive programming and other visitor information that | ▪ collaborate with local and regional cultural and academic institutions to develop interpretive programming and other visitor information that | ▪ collaborate with local and regional cultural and academic institutions to develop interpretive programming and other visitor information that |

**Table 2.13 Comparison of Alternatives – Virginia District**

| Subject | Alternative 1 | Alternative 2 | Alternative 3 (NPS Preferred) | Alternative 4 |
|---|---|---|---|---|
| | | would illuminate the cultural heritage of the eastern shore and Assateague Island | would illuminate the cultural heritage of the eastern shore and Assateague Island | would illuminate the cultural heritage of the eastern shore and Assateague Island |
| **Private Structures (oyster watch houses, hunting blinds) (in VA)** | ▪ continue to take no action related to privately owned structures associated with submerged land leases | ▪ work with Virginia to ensure appropriate wastewater treatment and disposal at privately owned structures located within the seashore's Virginia waters | ▪ work with Virginia to ensure appropriate wastewater treatment and disposal at privately owned structures located within the seashore's Virginia waters<br>▪ initiate an assessment of privately owned structures (oyster watch houses and hunting blinds) located within the seashore's Virginia waters to determine their legal status; pursue removal of any unauthorized structures | ▪ work with Virginia to ensure appropriate wastewater treatment and disposal at privately owned structures located within the seashore's Virginia waters<br>▪ initiate an assessment of privately owned structures (oyster watch houses and hunting blinds) located within the seashore's Virginia waters to determine their legal status; pursue removal of any unauthorized structures |
| **Cultural Resource Management (in MD)** | ▪ continued maintenance of former Assateague Beach U.S. Coast Guard Station and former Green Run Lodge<br>▪ no adaptive reuse of former Assateague Beach U.S. Coast Guard Station; limited actions to protect site from effects of natural coastal processes and/or climate change | ▪ no maintenance at former Assateague Beach U.S. Coast Guard Station or former Green Run Lodge<br>▪ no adaptive reuse of former Assateague Beach U.S. Coast Guard Station; no action to protect site from effects of natural coastal processes and/or climate change | ▪ continued maintenance of former Assateague Beach U.S. Coast Guard Station and former Green Run Lodge<br>▪ adaptive reuse of former Assateague Beach U.S. Coast Guard Station (with partner involvement); enhanced non-structural storm protection features as long as feasible to protect site from effects of natural coastal processes and/or climate change | ▪ continued maintenance of former Assateague Beach U.S. Coast Guard Station and former Green Run Lodge<br>▪ no adaptive reuse of former Assateague Beach U.S. Coast Guard Station; limited actions to protect site from effects of natural coastal processes and/or climate change |

## 2.12 Comparison of Impacts of the Alternatives

**Table 2.14 Comparison of Impacts of the Alternatives**

| Subject | Alternative 1 | Alternative 2 | Alternative 3 (NPS Preferred) | Alternative 4 |
|---|---|---|---|---|
| **Water Resources** | | | | |
| **Beneficial Impacts** | continued restoration of natural surface and groundwater flows as a result of natural resource management actions and rehabilitation of habitats altered by historic land uses and mosquito ditches | same as alternative 1, although the scope of management actions would diminish over time | expanded restoration of natural surface and groundwater flows as a result of natural resource management actions and rehabilitation of habitats altered by historic land uses and mosquito ditches | same as alternative 3 |
| | island floodplain functions slightly enhanced and flood potentials minimally reduced | same as alternative 1 | same as alternative 1 | same as alternative 1 |
| | wetland values enhanced throughout the seashore as a result of natural resource management actions | same as alternative 1 | wetland values further expanded (compared to alternative 1) throughout the seashore as a result of expanded resource management actions | same as alternative 3 |
| | reduced nutrient loads due to improved wastewater treatment | same as alternative 1 | same as alternative 1 | same as alternative 1 |
| | N/A | reduced pollutant discharges from oyster houses and hunting blinds in Virginia waters | same as alternative 2 | same as alternative 2 |
| | N/A | N/A | reduced pollutants loads on the north end by providing restrooms and reducing visitation by requiring a mooring permit to access the area by motorized vessel | elimination of most visitor induced pollutants on the north end by prohibiting access by motorized vessel |
| | N/A | N/A | reduced pollutant loads to the coastal bays by fostering collaborative partnerships focused on water quality management, including acquisition of mainland conservation easements | reduced pollutant loads to the coastal bays by fostering collaborative partnerships focused on water quality management |
| | N/A | N/A | reduced pollutant loads to Sinepuxent Bay by acquiring and restoring 150 to 200 acres of buffer lands (by NPS or its partners) along the mainland shore at new points of departure | N/A |

**Table 2.14 Comparison of Impacts of the Alternatives (continued)**

| Subject | Alternative 1 | Alternative 2 | Alternative 3 (NPS Preferred) | Alternative 4 |
|---|---|---|---|---|
| **Adverse Impacts** | N/A | diminished restoration of natural surface and groundwater flows due to natural resource management actions and rehabilitation of habitats altered by historic land uses | N/A | N/A |
| | continued potential for water contamination due to motorboat use, OSV use, routine seashore operations and maintenance | same as alternative 1 | same as alternative 1 | same as alternative 1 |
| | continued potential for sedimentation in nearby waters where visitor use facilities (lost due to coastal processes and/or climate change/sea level rise) are relocated within the MD Developed Area | same as alternative 1 | same as alternative 1 | same as alternative 1 |
| | N/A | potential for sedimentation in nearby waters during development of a relocated entrance station, ATS parking, and rehabilitated seashore headquarters complex on the mainland | potential for sedimentation in nearby waters during development of a relocated entrance station, ATS parking on the mainland, new headquarters complex, ferry docking facilities, bayside water access points (3), mainland points of departure (2), and mainland campground | potential for sedimentation in nearby waters during development of a relocated entrance station, ATS parking on the mainland, new headquarters complex, ferry docking facilities, and primitive campsites (approximately 150 sites on the island) |
| | N/A | minimal effects on floodplain functions due to development of a relocated entrance station and ATS parking on the mainland | minimal effects on floodplain functions due to development as in alternative 2, and due to new facilities on the mainland (see row above) | minimal effects on floodplain functions due to development as in alternative 2, and due to new facilities on the mainland (see row above) |
| | N/A | potential for wetland impacts at new development sites *(see row above)* | potential for wetland impacts at new development sites as in alternative 2, and at additional new facility sites on the mainland *(see two rows above)* | potential for wetland impacts at new development sites as in alternative 2, and at additional new facility sites on the mainland *(see two rows above)* |

**Table 2.14 Comparison of Impacts of the Alternatives (continued)**

| Subject | Alternative 1 | Alternative 2 | Alternative 3 (NPS Preferred) | Alternative 4 |
|---|---|---|---|---|
| **Vegetation** | | | | |
| **Beneficial Impacts** | continued rehabilitation of habitats altered by historic land uses and mosquito ditches | same as alternative 1, although the scope of management actions would diminish over time | expanded rehabilitation of habitats altered by historic land uses and mosquito ditches | same as alternative 3 |
| | continued rehabilitation of habitats by removal of the invasive *Phragmites australis* | same as alternative 1, although the scope of management actions would diminish over time | expanded program to remove the invasive *Phragmites australis* | same as alternative 3 |
| | reduced trampling and overgrazing of vegetation due to continued feral horse management to achieve a sustainable population of 80 to 100 individuals | same as alternative 1 | same as alternative 1 | same as alternative 1 |
| | reduced trampling and overgrazing of vegetation due to continued deer herd management through managed hunting | same as alternative 1 | same as alternative 1 | same as alternative 1 |
| | vegetation restoration in the north end by continuation of existing programs to restore natural overwash fans | same as alternative 1 | same as alternative 1 | same as alternative 1 |
| | vegetation restoration in beach and intertidal habitats by continuation of the north end Restoration Project | same as alternative 1 | same as alternative 1 | same as alternative 1 |
| | N/A | N/A | return to more natural conditions on the island as visitor facilities are lost due to the impacts of coastal processes and/or the effects of climate change | same as alternative 3, although occurring sooner |
| | N/A | N/A | reduced visitor impacts to vegetation in the north end by reducing visitation by requiring a mooring permit to access the area by motorized vessel | elimination of most visitor impacts on vegetation in the north end by prohibiting access by motorized vessel |
| **Adverse Impacts** | N/A | diminished rehabilita-tion of habitats altered by historic land uses | N/A | N/A |
| | trampling and loss of vegetation due to continued visitor use within the MD Developed Area and the OSV use area | same as alt 1, although the area of impacts would be confined within a smaller footprint | same as alt 1, although the area of impact would change as facilities are relocated to more sustainable locations | same as alt 1, although the area of impact would diminish as facilities damaged by coastal pro-cesses and the effects of climate change/sea level rise are not replaced |

**Table 2.14 Comparison of Impacts of the Alternatives (continued)**

| Subject | Alternative 1 | Alternative 2 | Alternative 3 (NPS Preferred) | Alternative 4 |
|---|---|---|---|---|
| | reduced habitat maintenance due to continued maintenance of the artificial dune in the MD Developed Area and at the Assateague Beach U.S. Coast Guard Station | further reduced habitat maintenance due to expanded fortification of the MD Developed Area | less reduced habitat maintenance (when compared to alternative 1) due to limited maintenance of the artificial dune in the MD Developed Area | same as alternative 3 |
| | potential impacts of overgrazing if OSV use area access is lost due to reduced hunting pressure | increased potential for overgrazing due to reduction in size of OSV use area and associated reduced hunting pressure; further potential for overgrazing impacts if OSV use area access is lost | same as alternative 1 | same as alternative 1 |
| | loss of vegetation where visitor use facilities (lost due to coastal processes and/or climate change/sea level rise) are relocated within the MD Developed Area | same as alternative 1 | same as alternative 1,as long as sustainable sites for relocated facilities are available on the island | loss of vegetation where primitive campsites mad available to replace lost developed campsites (other facilities lost on the island would not be replaced) |
| | N/A | loss of old field, mowed grass, and landscaped vegetation at the sites of the relocated entrance station, ATS parking, and rehabilitated seashore headquarters complex on the mainland | loss of old field, mowed grass, landscaped vegetation, and wooded areas at the sites of the relocated entrance station, ATS parking on the mainland, new headquarters complex, ferry docking facilities, bayside water access points (3), mainland points of departure (2), and mainland campground | loss of old field, mowed grass, landscaped vegetation, and wooded areas at the sites of the relocated entrance station, ATS parking on the mainland, new headquarters complex, ferry docking facilities, and primitive campsites on the island (approximately 150 sites on the island) |
| **Wildlife** | | | | |
| **Beneficial Impacts** | continued rehabilitation of habitats altered by historic land uses and mosquito ditches | same as alternative 1, although the scope of management actions would diminish over time | expanded rehabilitation of habitats altered by historic land uses and mosquito ditches | same as alternative 3 |
| | continued rehabilitation of habitats by removal of the invasive *Phragmites australis* | same as alternative 1, although the scope of management actions would diminish over time | expanded program to remove the invasive *Phragmites australis* | same as alternative 3 |
| | reduced trampling and overgrazing of habitat areas due to continued feral horse management to achieve a sustainable population of 80 to 100 individuals | same as alternative 1 | same as alternative 1 | same as alternative 1 |
| | reduced trampling and overgrazing of habitat areas due to continued deer herd management through managed hunting | same as alternative 1 | same as alternative 1 | same as alternative 1 |

**Table 2.14 Comparison of Impacts of the Alternatives (continued)**

| Subject | Alternative 1 | Alternative 2 | Alternative 3 (NPS Preferred) | Alternative 4 |
|---|---|---|---|---|
| | habitat restoration in the north end by continuation of existing programs to restore natural overwash fans | same as alternative 1 | same as alternative 1 | same as alternative 1 |
| | habitat restoration in beach and intertidal habitats by continuation of the North End Restoration Project | same as alternative 1 | same as alternative 1 | same as alternative 1 |
| | N/A | N/A | return to more natural conditions on the island as visitor facilities are lost due to the impacts of coastal processes and/or the effects of climate change | same as alternative 3, although occurring sooner |
| | N/A | N/A | reduced visitor impacts to habitats in the north end by reducing visitation by requiring a mooring permit to access the area by motorized vessel | elimination of most visitor impacts on habitats in the north end by prohibiting access by motorized vessel |
| | N/A | new research supporting better future manage-ment of marine wildlife | same as alternative 2 | same as alternative 2 |
| | N/A | direct contribution to a reduced decline of spawning horseshoe crabs in the Toms Cove area due to enforcement of existing laws prohibiting harvest | same as alternative 2 | same as alternative 2 |
| **Adverse Impacts** | N/A | diminished rehabilita-tion of habitats altered by historic land uses | N/A | N/A |
| | trampling and loss of habitats due to continued visitor use within the MD Developed Area and the OSV use area | same as alternative 1, although the area of impacts would be confined within a smaller footprint | same as alternative 1, although the area of impact would change as facilities are relocated to more sustainable locations | same as alternative 1, although the area of impact would diminish as facilities lost or damaged by coastal processes and the effects of climate change sea level rise are not replaced |
| | reduced habitat maintenance due to continued maintenance of the artificial dune in the MD Developed Area and at the Assateague Beach U.S. Coast Guard Station | further reduced habitat maintenance due to expanded fortification of the MD Developed Area | less reduced habitat maintenance (when compared to alternative 1) due to limited maintenance of the artificial dune in the MD Developed Area | same as alternative 3 |
| | potential impacts of overgrazing if OSV use area access is lost due to reduced hunting pressure | increased potential for overgrazing due to reduction in size of OSV use area and associated reduced hunting pressure; further potential for overgrazing | same as alternative 1 | same as alternative 1 |

**Table 2.14 Comparison of Impacts of the Alternatives (continued)**

| Subject | Alternative 1 | Alternative 2 | Alternative 3 (NPS Preferred) | Alternative 4 |
|---|---|---|---|---|
| | | impacts if OSV use area access is lost | | |
| | loss of habitat where visitor use facilities (lost due to coastal processes and/or climate change/sea level rise) are relocated within the MD Developed Area | same as alternative 1 | same as alternative 1,as long as sustainable sites for relocated facilities are available on the island | loss of habitat where primitive campsites mad available to replace lost developed campsites (other facilities lost on the island would not be replaced) |
| | N/A | loss of old field, mowed grass, and landscaped vegetation at the sites of the relocated entrance station, ATS parking, and rehabilitated seashore headquarters complex on the mainland | loss of old field, mowed grass, landscaped vegetation, and wooded areas at the sites of the relocated entrance station, ATS parking on the mainland, new headquarters complex, ferry docking facilities, bayside water access points (3), mainland points of departure (2), and mainland campground | loss of old field, mowed grass, landscaped vegetation, and wooded areas at the sites of the relocated entrance station, ATS parking on the mainland, new headquarters complex, ferry docking facilities, and primitive campsites on the island (approximately 150 sites on the island) |
| | direct contribution to a decline of spawning horseshoe crabs in the Toms Cove area due to continued harvest | N/A | N/A | N/A |
| **Federally Listed Threatened or Endangered Species** | | | | |
| **Beneficial Impacts** (to beach and overwash fan habitat where piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) are known to occur) | reduced trampling and overgrazing of beach and overwash fan habitat areas due to continued feral horse management to achieve a sustainable population of 80 to 100 individuals | same as alternative 1 | same as alternative 1 | same as alternative 1 |
| | reduced trampling and overgrazing of beach and overwash fan habitat areas due to continued deer herd management through managed hunting | same as alternative 1 | same as alternative 1 | same as alternative 1 |
| | N/A | reduced potential for trampling and visitor use impacts in beach and intertidal habitats due to reduced OSV use area (38% of current size) | N/A | N/A |
| | habitat restoration in beach and intertidal habitats by continuation of the North End Restoration Project | same as alternative 1 | same as alternative 1 | same as alternative 1 |

**Table 2.14 Comparison of Impacts of the Alternatives (continued)**

| Subject | Alternative 1 | Alternative 2 | Alternative 3 (NPS Preferred) | Alternative 4 |
|---|---|---|---|---|
| | N/A | N/A | return to more natural conditions on the island as visitor facilities are lost due to the impacts of coastal processes and/or the effects of climate change | same as alternative 3, although occurring sooner |
| | N/A | N/A | reduced visitor impacts to habitats in the north end by reducing visitation by requiring a mooring permit to access the area by motorized vessel | elimination of most visitor impacts on habitats in the north end as a result of prohibiting access by motorized vessel |
| **Adverse Impacts** (to beach and overwash fan habitat where piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) are known to occur) | trampling and loss of habitats due to continued visitor use within the OSV use area | same as alternative 1, | same as alternative 1, although the area of impact would diminish as facilities lost or damaged by coastal processes and the effects of climate change sea level rise are not replaced | same as alternative 3 |
| | potential impacts of overgrazing if OSV use area access is lost due to reduced hunting pressure | increased potential for overgrazing due to reduction in size of OSV use area and associated reduced hunting pressure; further potential for overgrazing impacts if OSV use area access is lost | same as alternative 1 | same as alternative 1 |
| **Historic Structures** | | | | |
| **Beneficial Impacts** | continued maintenance of *National Register* eligible historic structures | N/A | continued maintenance of *National Register* eligible historic structures | continued maintenance of *National Register* eligible historic structures |
| | limited protection of *National Register* eligible historic structures from natural coastal processes and/or effects of climate change/sea level rise | N/A | enhanced protection of *National Register* eligible historic structures from natural coastal processes and/or effects of climate change/sea level rise | limited protection of *National Register* eligible historic structures from natural coastal processes and/or effects of climate change/sea level rise |
| | N/A | N/A | enhanced protection as a result of adaptive reuse of *National Register* eligible historic structures | enhanced protection as a result of adaptive reuse of one *National Register* eligible historic structures |
| **Adverse Impacts** | eventual loss of *National Register* eligible historic structures due to natural coastal processes and/or effects of climate change/sea level rise | no maintenance of *National Register* eligible historic structures | eventual loss of *National Register* eligible historic structures due to natural coastal processes and/or effects of climate change/sea level rise (later when compared to alternatives 1 and 4) | eventual loss of *National Register* eligible historic structures due to natural coastal processes and/or effects of climate change/sea level rise |

**Table 2.14 Comparison of Impacts of the Alternatives (continued)**

| Subject | Alternative 1 | Alternative 2 | Alternative 3 (NPS Preferred) | Alternative 4 |
|---|---|---|---|---|
| **Cultural Landscapes** | | | | |
| **Beneficial Impacts** | continued maintenance of *National Register* eligible cultural landscape | N/A | continued maintenance of *National Register* eligible cultural landscape | continued maintenance of *National Register* eligible cultural landscape |
| | limited protection of *National Register* eligible cultural landscape from natural coastal processes and/or effects of climate change/sea level rise | N/A | enhanced protection of *National Register* eligible cultural landscape from natural coastal processes and/or effects of climate change/sea level rise | limited protection of *National Register* eligible cultural landscape from natural coastal processes and/or effects of climate change/sea level rise |
| | N/A | N/A | enhanced protection as a result of adaptive reuse of *National Register* eligible cultural landscape | N/A |
| **Adverse Impacts** | eventual loss of *National Register* eligible cultural landscape due to natural coastal processes and/or effects of climate change/sea level rise | no maintenance of *National Register* eligible cultural landscape | eventual loss of *National Register* eligible cultural landscape due to natural coastal processes and/or effects of climate change/sea level rise (later when compared to alternatives 1 and 4) | eventual loss of *National Register* eligible cultural landscape due to natural coastal processes and/or effects of climate change/sea level rise |
| **Seashore Operations** | | | | |
| **Beneficial Impacts** | minimal operational efficiencies gained as a result of initial actions to rehabilitate the seashore headquarters complex | major operational efficiencies gained as a result of reconstruction of the seashore headquarters complex at its current site | major operational efficiencies gained as a result of construction of a new seashore headquarters complex at a new location (likely to be co-located with new state park facilities) | same as alternative 3 |
| | N/A | enhanced and more efficient seashore operations due to relocated entrance station, developed and operated in partnership with MD DNR | same as alternative 2 | same as alternative 2 |
| | N/A | enhanced and more efficient seashore operations due to implementation of a mainland-based ATS | same as alternative 2 | same as alternative 2 |
| | existing partnerships and volunteer programs facilitate some functions to protect seashore resources and provide recreation | same as alternative 1 | many expanded and new partnerships and volunteer programs facilitate a much broader range of functions to protect seashore resources and provide recreation opportunities | a few expanded and new partnerships and volunteer programs facilitate more functions to protect seashore resources and provide recreation opportunities |

**Table 2.14 Comparison of Impacts of the Alternatives (continued)**

| Subject | Alternative 1 | Alternative 2 | Alternative 3 (NPS Preferred) | Alternative 4 |
|---|---|---|---|---|
| | N/A | expanded partnership with USACE to protect MD Developed Area provides some protection against interruptions to seashore operations due to storm damage | expanded partnership with MD DNR to begin immediately to relocate some visitor facilities to the mainland and to develop joint administrative and maintenance facilities on the mainland ensures protection against interruptions to most seashore operations due to storm damage | expanded partnership with MD DNR to develop joint administrative and maintenance facilities on the mainland better protects against interruptions to seashore operations due to storm damage |
| | N/A | N/A | completion of a plan for water-based visitor access and seashore operations positions the seashore to restore access and operations relatively quickly in the event of potential sudden loss of access via a catastrophic storm | same as alternative 3 |
| **Adverse Impacts** | N/A | staffing not adequate to support natural resource management actions and visitor use and visitor experience actions in alternative 2, unless increased funding from the ONPS budget becomes available | staffing not adequate to support natural resource management actions and visitor use and visitor experience actions in alternative 3 | staffing not adequate to support natural resource management actions and visitor use and visitor experience actions in alternative 4 |
| | seashore facilities exposed to very high risk and uncertainty of becoming abruptly inaccessible in the event of a catastrophic storm; seashore would be unable to operate without vehicular access | same as alternative 2 | N/A | N/A |
| **Access and Circulation** | | | | |
| **Beneficial Impacts** | N/A | enhanced and more efficient seashore access due to relocated entrance station, developed and operated in partnership with MD DNR | same as alternative 2 | same as alternative 2 |
| | N/A | enhanced and more efficient seashore access and circulation due to implementation of a mainland-based ATS | same as alternative 2 | same as alternative 2 |

**Table 2.14 Comparison of Impacts of the Alternatives (continued)**

| Subject | Alternative 1 | Alternative 2 | Alternative 3 (NPS Preferred) | Alternative 4 |
|---|---|---|---|---|
| | N/A | N/A | access to the backcountry enhanced by addition of 2 mainland points of departure and 3 new bayside access points | N/A |
| | N/A (see adverse impacts – if access is lost due to a breach, relocation of the OSV use area would not be considered) | same as alternative 1 | if access is lost due to a breach, the OSV use area could be relocated to another location (potentially north of the MD Developed Area) | same as alternative 1 |
| | restoration of water access to Assateague Beach U.S. Coast Guard Station | same as alternative 1 | same as alternative 1 | same of alternative 1 |
| | N/A | N/A | completion of a plan for water-based visitor access and seashore operations positions the seashore to restore access and operations relatively quickly in the event of potential sudden loss of access via a catastrophic storm | same as alternative 3 |
| **Adverse Impacts** | serious congestion would remain within the MD Developed Area on summer weekends because access management actions would not address chronic access issues | some congestion would remain within the MD Developed Area on summer weekends following implementation of access management actions ; over the long-term concentration of visitor facilities within a shrinking fortified land area would increase congestion and reduce access | some congestion would remain within the MD Developed Area on summer weekends following implementation of access management actions | same as alternative 3 |
| | N/A (OSV use area remains the same) | reduced vehicular access to the beach due to reduction of OSV use area to 38% of its current size | N/A (OSV use area would remain the same) | N/A (OSV use area would remain the same) |
| | if access is lost due to a breach, the OSV use area could be reduced in size or lost entirely (relocation would not be considered) | same as alternative 1 | N/A (if access is lost due to a breach, OSV use area could be relocated to another area) | same as alternative 1 |
| | N/A | N/A | reduced visitor access to the north end due to implementation of a mooring permit requirement | reduced visitor access to the north end due to prohibition of access by motorized vessel |
| | due to lack of a contingency plan for responding to catastrophic storms and the effects of climate | same as alternative 1 | N/A | N/A |

**Table 2.14 Comparison of Impacts of the Alternatives (continued)**

| Subject | Alternative 1 | Alternative 2 | Alternative 3 (NPS Preferred) | Alternative 4 |
|---|---|---|---|---|
| | change/sea level rise, transportation infrastructure would remain in non-sustainable locations subject to recurring damage and eventual loss as the island's land area continues to shrink; very high risk and uncertainty of becoming abruptly inaccessible in the event of a catastrophic storm; seashore would be inaccessible to visitors for months to years | | | |
| **Visitor Experience** | | | | |
| **Beneficial Impacts** | N/A | enhanced visitor experience due to less stressful seashore entry via a relocated entrance station | same as alternative 2 | same as alternative 2 |
| | N/A | enhanced visitor experience due to reduced congestion as a result of implementing a mainland-based ATS | same as alternative 2 | same as alternative 2 |
| | N/A | N/A | backcountry visitor experiences enhanced by addition of 2 mainland points of departure, 3 new bayside access points, and new camping opportunities on Egging Island | N/A |
| | N/A (see adverse impacts – if access is lost due to a breach, opportunities for driving on the beach (and associated recreation activities) would be lost | same as alternative 1 | if access is lost due to a breach, opportunities for driving on the beach (and associated recreation activities) would likely be maintained as the OSV | same as alternative 1 |
| | as relocation of the OSV use area would not be considered) | | use area could be relocated to another location (potentially north of the MD Developed Area) | |
| | visitor experiences at the Assateague Beach U.S. Coast Guard Station made possible by water (new docking facilities) during times when land access via the OSV use area is not possible due to nesting piping plovers | same as alternative 1 | same as alternative 1 | same of alternative 1 |

**Table 2.14 Comparison of Impacts of the Alternatives (continued)**

| Subject | Alternative 1 | Alternative 2 | Alternative 3 (NPS Preferred) | Alternative 4 |
|---|---|---|---|---|
| | N/A | N/A | completion of a plan for water-based visitor access and seashore operations positions the seashore to restore visitor access to seashore experiences relatively quickly in the event of potential sudden loss of access via a catastrophic storm | same as alternative 3 |
| | N/A | N/A | opportunities for developed camping at the seashore maintained by replacing lost or damaged developed campsites in more sustainable locations on the island; an expanded partnership with MD DNR begins planning to relocate developed campsites to the mainland to ensure opportunities for developed camping in the event vehicular access is lost | opportunities for primitive camping in the Maryland Developed Area expanded by replacement of lost or damaged developed campsites with up to 150 primitive campsites in more sustainable locations on the island |
| **Adverse Impacts** | visitor experience seriously diminished due to serious congestion within the MD Developed Area on summer weekends | same as alternative 1; over the long-term concentration of visitor facilities within a shrinking fortified land area would increase congestion and diminish the visitor experience | same as alternative 1 | same as alternative 1 |
| | N/A (opportunities for driving on the beach (and associated recreation activities) would remain the same, as the OSV use area be unchanged) | reduced opportunities for driving on the beach (and associated recreation activities) due to reduction of OSV use area to 38% of its current size | N/A (opportunities for driving on the beach (and associated recreation activities) would remain the same, as the OSV use area be unchanged) | N/A (opportunities for driving on the beach (and associated recreation activities) would remain the same, as the OSV use area be unchanged) |
| | if access is lost due to a breach, opportunities for driving on the beach (and associated recreation activities) would be lost as relocation of the OSV use area would not be considered | same as alternative 1 | N/A (if access is lost due to a breach, opportunities for driving on the beach (and associated recreation activities) would likely remain the same as the OSV use area could be relocated to another area) | same as alternative 1 |
| | N/A | N/A | reduced opportunities for recreation in the north end due to implementation of a mooring permit requirement | reduced opportunities for recreation in the north end due to prohibition of access by motorized vessel |

**Table 2.14 Comparison of Impacts of the Alternatives (continued)**

| Subject | Alternative 1 | Alternative 2 | Alternative 3 (NPS Preferred) | Alternative 4 |
|---|---|---|---|---|
| | due to lack of a contingency plan for responding to catastrophic storms and the effects of climate change/sea level rise, opportunities for visitors to experience the seashore would be at very high risk of being lost; opportunities for visitors would be lost for months to years | same as alternative 1 | N/A | N/A |
| **Socio-economic Environment** | | | | |
| **Beneficial Impacts** | continued visitation with associated visitor spending, job creation, labor income and value added would benefit the local economy | same as alternative 1 | same as alternative 1 | same as alternative 1 |
| | beneficial impact to some commercial waterman due to continued horseshoe crab harvest | N/A | N/A | N/A |
| **Adverse Impacts** | when vehicular access is lost, lack of contingency planning would make the island inaccessible to visitors for months to years; visitor spending would drop to approximately 5% of its previous levels with similar drops in job creation, labor income, and value added to the local economy; there would be uncertainty as to when visitor access and associated economic benefits could be restored | same as alternative 1 | when vehicular access is lost, contingency planning would relatively quickly restore access to the island; until access is restored visitor spending would drop to approximately 5 % of its previous levels with similar drops in job creation, labor income, and value added to the local economy; there would be certainty as to when visitor access via water-based transportation would be restored; within a few years visitation would return to or near that when vehicular access was possible | same as alternative 3, except that within a few years, visitation would return to approximately 50% of that when vehicular access was possible |
| | N/A | adverse impact to some commercial watermen due to enforcement of existing laws prohibiting horseshoe crab harvest | same as alternative 2 | same as alternative 2 |

## 2.13 Consistency with Sections 101 and 102(1) of NEPA

The NPS requirements for implementing NEPA include an analysis of how each alternative meets or achieves the purposes of NEPA, as stated in Sections 101(b) and 102(1). Each alternative analyzed in a NEPA document must be assessed as to how it meets the following purposes:

- fulfills the responsibilities of each generation as trustee of the environment for succeeding generations
- ensures for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings
- attains the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences
- preserves important historic, cultural, and natural aspects of our national heritage and maintains, wherever possible, an environment that supports diversity and variety of individual choice
- achieves a balance between population and resource use that would permit high standards of living and a wide sharing of life's amenities
- enhances the quality of renewable resources and approach the maximum attainable recycling of depletable resources

### Criterion 1: Fulfills the responsibilities of each generation as trustee of the environment for succeeding generations.

All management alternatives would fulfill criterion 1 by preserving the seashore's fundamental resources and values for succeeding generations. Alternative 1 would be largely reactive in its management approach and generally would protect and preserve the seashore's natural resources in their current state and would continue existing cultural resource management practices. Alternative 2 would fulfill this criterion in the most limited way by diminishing some natural resource management programs as NPS resources are directed to protection of recreation opportunities and no actions are taken to physically protect cultural resources from the effects of natural coastal processes and/or climate change/sea level rise. Alternative 3 (NPS preferred alternative) would fulfill this criterion most broadly by expanding natural resource management programs, by broadening the scope of some programs to address issues created by global climate change, implementing sustainable management strategies for cultural resources, emphasizing identification of currently unknown cultural resources, and documenting cultural resources threatened by natural coastal processes and the effects of climate change/sea level rise. Alternative 4 would also broadly fulfill this criterion by expanding natural resource management programs, broadening the scope of some programs to address mitigation of human impacts and climate change adaptation, expanding cooperative research, and making some effort to document known cultural resources threatened by natural coastal processes and the effects of climate change/sea level rise.

### Criterion 2: Assures for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings.

How well each alternative fulfills criterion 2 is a function of how seashore management responds to natural coastal processes and the effect of climate change/sea level rise. In alternative 1 opportunities for Americans to experience traditional beach recreation in aesthetically pleasing surroundings would continue as long as access is maintained and facilities are sustained given available funds; management would continue to have no plan for potential loss of bridge access with the possibility that the seashore experiences could become inaccessible to visitors for months to years following major storm events. Alternative 2 would least fulfill criterion 2 by concentrating visitor use in a high density visitor use area, thereby increasing crowding and diminishing the quality of the seashore experience for most visitors; furthermore, as in alternative 1, management would continue to have no plan for potential loss of bridge access with the possibility that the seashore experiences could become inaccessible to visitors for months to years following major storm events. Alternative 3 (NPS preferred alternative) would fulfill criterion 2 to the greatest degree by focusing on maintaining recreation uses and activities over time for the greatest number of visitors; managers would let the island evolve naturally (moving visitor facilities to more sustainable locations) and provide for uninterrupted access to the island and the beach once vehicular access is lost; overall, there would be less visitor crowding and the experience would continue in a more natural seashore setting. Alternative 4 would ultimately preserve the seashore in its most natural and aesthetically pleasing state by letting the island evolve naturally without interference, maintaining facilities only until they are lost, severely damaged, or become obsolete; because the seashore would become harder to access fewer people would have the experience, although for those visitors who get to the seashore there would be greater opportunities to experience solitude within the natural setting.

### Criterion 3: Attains the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences.

Alternative 3 (NPS preferred alternative) would fulfill criterion 3 to the greatest degree by maintaining recreation uses and activities over time for the greatest number of visitors; managers would let the island evolve naturally (moving visitor facilities to more sustainable locations) and provide for uninterrupted access to the island and the beach once vehicular access is lost; all existing visitor activities would continue to be available although in different locations and with different intensities. In alternative 1, management would focus supported continued uses of the seashore environment as long as access is maintained and facilities are sustained given available funds; management would continue to have no plan for potential loss of bridge access with the possibility that the seashore experiences could become inaccessible to visitors for months to years following major storm events. In alternative 2, over time the land area available for traditional beach recreation would shrink, making it harder to provide for the full range of visitor activities now available at the seashore; furthermore, as in

alternative 1, management would continue to have no plan for potential loss of bridge access with the possibility that the seashore experiences could become inaccessible to visitors for months to years following major storm events. In alternative 4, management would gradually shift visitor use to a primitive day-use experience, eliminating and/or making difficult many seashore activities now available to visitors

**Criterion 4: Preserves important historic, cultural, and natural aspects of our national heritage and maintains, wherever possible, an environment that supports diversity and variety of individual choice.**

All of the proposed management alternatives would achieve this criterion to some degree. Alternative 1 would be largely reactive in its management approach and generally would protect and preserve the seashore's natural resources in their current state and would continue existing cultural resource management practices; as long as vehicular access is maintained visitors would continue to have flexibility with respect to choosing how to experience the seashore; once vehicular access is lost, the lack of contingency planning could make the seashore inaccessible to most visitors for months to years following major storm events, thus eliminating the choice of experiencing the seashore. Alternative 2 would fulfill this criterion in the most limited way by diminishing some natural resource management programs as NPS resources are directed to protection of recreation opportunities and no actions are taken to physically protect cultural resources from the effects of natural coastal processes and/or climate change/sea level rise; as in other the alternatives, as long as vehicular access is maintained visitors would continue to have flexibility with respect to choosing how to experience the seashore; as in alternative 1, the lack of planning for potential loss of bridge access could make the seashore inaccessible to most visitors for months to years following major storm events, thus eliminating the choice of experiencing the seashore. Alternative 3 (NPS preferred alternative) would fulfill this criterion most broadly by expanding natural resource management programs, by broadening the scope of some programs to address issues created by global climate change, implementing sustainable management strategies for cultural resources, emphasizing identification of currently unknown cultural resources, and documenting cultural resources threatened by natural coastal processes and the effects of climate change/sea level rise; as in the other alternatives, as long as vehicular access is maintained visitors would continue to have flexibility with respect to choosing how to experience the seashore; once vehicular access is lost, contingency planning would largely sustain individual choice by providing for uninterrupted access to the island and the beach. Alternative 4 would also broadly fulfill this criterion by expanding natural resource management programs, broadening the scope of some programs to address mitigation of human impacts and climate change adaptation, expanding cooperative research, and making some effort to document known cultural resources threatened by natural coastal processes and the effects of climate change/sea level rise; however, in alternative 4 management would also gradually shift visitor use to a primitive day-use experience, eliminating and/or making

difficult many seashore activities now available to visitors, and thereby reducing individual choice as to the experience that they can have at the seashore.

### Criterion 5: Achieves a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities.

All of the proposed management alternatives seek to achieve a balance between population and resource use, although some alternatives would achieve this balance better than others. In alternatives 1 and 2 managers would continue to offer safe traditional beach recreation, considered one of life's amenities by most seashore visitors; however, there would continue to be no contingency planning to address the effects of coastal process and climate change/sea level rise, with the possibility that, if bridge access is lost, the seashore's recreation amenities could become inaccessible to visitors for months to years following major storm events. Alternative 3 (NPS preferred alternative) would to the greatest degree fulfill criterion 5 by continuing to offer safe traditional beach recreation while simultaneously making facilities more sustainable; contingency planning would ensure that visitors would continue to experience safe traditional beach recreation and other seashore activities by providing for uninterrupted access to the island and the beach, although fewer visitors would likely visit the seashore once vehicular access is not possible. In alternative 4, management would gradually shift visitor use to a primitive day-use experience eliminating and/or making difficult many seashore activities now available to visitors; however, contingency planning would ensure that visitors would continue to experience safe traditional beach recreation and other day-use seashore activities by providing for uninterrupted access to the island and the beach, although fewer visitors would likely visit the seashore once vehicular access is not possible.

### Criterion 6: Enhances the quality of renewable resources and approaches the maximum attainable recycling of depletable resources.

All management alternatives would fulfill criterion 6 by generally conserving natural resources through efforts to systematically update park infrastructure and equipment to address energy efficiency, water conservation, wastewater management, and the use of sustainable materials. Beyond these measures, how well each alternative fulfills criterion 6 is a function of how seashore management responds to natural coastal processes and the effect of climate change/sea level rise. Alternative 1 would continue to repair/replace facilities damaged by storms at or near their current location, if funding is available, exposing additional renewable resources to continued loss. Alternative 2 would fulfill this criterion in the most limited manner by repairing/replacing facilities damaged by storms and by using renewable resources to fortify the island to protect it from threats and to close breaches and/or new inlets in developed areas of the seashore, thereby exposing more renewable resources to continued loss. Alternative 3 (NPS preferred alternative) would manage the seashore using a climate change adaptation strategy, letting the island evolve naturally and relocating/designing new facilities to be more sustainable, thus exposing fewer additional depletable resources to continued loss.

Alternative 4 would fulfill this criterion most broadly by allowing natural island evolution to occur without interference and maintaining facilities only until they are severely damaged or become obsolete, thus exposing only minimal additional depletable resources to continued loss.

## 2.14 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).

The NPS has determined that the environmentally preferable alternative is alternative 3. This conclusion is based on careful review of potential impacts as a result of implementing the management alternatives and assessing proposed mitigation for cultural and natural resource impacts. Alternative 3 best protects, preserves, and enhances the seashore's natural, cultural, and recreation resources. Alternative 3 proposes to allow climate change adaptation to play an increasingly important role in seashore management , generally letting the island to evolve naturally while continuing to provide opportunities for traditional recreation uses that can better sustain the damaging effects of natural coastal processes and/or climate change/sea level rise.

## 2.15 Identification of the NPS Preferred Alternative

The NPS has identified alternative 3 as the NPS preferred alternative to guide long-term management of Assateague Island National Seashore. NPS decision makers considered the information collected during scoping, the results of the impact analysis, and the seashore's purpose and significance. Findings supported selection of alternative 3 as the NPS preferred alternative because it would provide the highest degree of enhanced public use and enjoyment of the seashore, would provide the highest degree of protection to the seashore's fundamental and other important resources and values, would offer the greatest potential for enhanced coastal resiliency, and would support the most effective organizational management for the seashore.

## 2.16 Future Planning and Implementation (NPS Preferred Alternative)

Implementation of the NPS preferred alternative would likely include a series of additional focused planning efforts (table 2.15). Initially, the seashore would complete a strategic plan that would establish priorities and guidance for the specific actions needed to position the seashore to respond to coastal processes and the effects of climate change/sea level rise as proposed in the preferred alternative. NPS would also consider completing several additional plans focused on specific aspects of seashore management. All plans would include an analysis of the potential effects of coastal processes and/or climate change/sea level rise, employ relevant department and agency standards and guidelines, and incorporate recommendations of the Hurricane Sandy Task Force. The process for completing each plan would include coordination with stakeholders, academic institutions, local governments, and state and federal agencies, as appropriate.

**Table 2.15 Summary of Future Implementation Planning Needs (NPS Preferred Alternative)**

| Future Planning Need | Plan Description | Priority |
|---|---|---|
| **Seashore-wide Plans** | | |
| strategic plan for operations in Virginia and Maryland | would identify and prioritize actions needed to position the seashore to respond to coastal processes and the effects of climate change/sea level rise as proposed in the NPS preferred alternative; would address the major new investments and seashore operational and facility changes identified in the GMP, such as providing water-based visitor access and seashore operations, developing new facilities on the mainland in collaboration with MD DNR, Worcester County, and other partners, and maintaining operations until such time as the relocation of the recreational beach occurs, in partnership with FWS, the town of Chincoteague, Accomack County, and other partners | high |
| breach management plan | would guide NPS's response to future breaches, specifying conditions under which NPS would allow breaches to remain open or would allow breach closures; would reflect existing NPS policy for shorelines and barrier islands found in section 4.8.1.1 of *NPS Management Policies* (NPS 2006c); would include actions to be taken in the event that access to some or all of the OSV use area is lost, including modification to existing regulations in 36 CFR§7.65(b), as needed, regarding travel by OSV between Assateague State Park and the Ocean City Inlet. | high |
| water-based visitor access and seashore operations plan | would describe in detail operational considerations and capital investments needed to provide water-based visitor access and to support seashore operations, including which types and levels of activities, services, and facilities would be provided by commercial service providers and how they would be managed by NPS in the most effective and efficient manner | high |
| assessment of eligibility/wilderness study | undertake assessment of eligibility and prepare a wilderness study that considers the wilderness boundary in the context of new assessment of acreage, climate change, sea level rise and erosion, as well as specific shoreline management activities (e.g., breach management); addresses the boundary relative to the OSV corridor, and access corridors that are required for administrative use | medium |
| commercial services plan | would describe in detail which types and levels of activities, services, and facilities would be provided by commercial service providers and how NPS would manage them in the most effective and efficient manner | medium |

**Table 2.15 Summary of Future Implementation Planning Needs (NPS Preferred Alternative)(continued)**

| Future Planning Need | Plan Description | Priority |
|---|---|---|
| archeological overview and assessment | would inventory previously identified archeological sites and provide a template for their management and protection and serve as guidance for the management of any other sites identified in the future | medium |
| long-range interpretive plan | would provide a vision for future interpretation and education for 5 to 10 years; would include interpretive themes, goals for programs and services, issues affecting interpretation, desired visitor experiences, visitor profiles and future interpretive programs (personal services, non-personal services, partnerships, library and collection needs, staffing needs, interpretive program costs, and implementation plan) | medium |
| collections management plan | would provide necessary guidance to address issues of preserving protecting, storing, documenting, accessing, and using the seashore's museum and archival collections | high |
| marine resources management plan | would provide better information on recreational and commercial fishing and would inform management of visitor use of marine resources | low |
| **Shoreline Stabilization Plans** | | |
| MD Visitor Center shoreline | would provide design guidance for stabilization of the shoreline in the vicinity of the NPS visitor center on the Maryland mainland | low |
| Green Run Lodge shoreline | would provide design guidance for reconstructing the dock at Green Run Lodge as one of the three new backcountry bayside accesses | low |
| **New Facilities Plans** | | |
| relocated MD entrance station | in collaboration with MD DNR and MD SHA, would include a master plan and design guidance for relocating the MD entrance station to the mainland | low |
| mainland parking shuttle | in collaboration with MD DNR and MD SHA, would include a detailed service plan and design guidance for a mainland-based parking shuttle, including identification of commercial service providers and how they would be managed by NPS in the most effective and efficient manner | medium |
| seashore headquarters complex | in collaboration with MD DNR, would include a master plan and design guidance for development of a new seashore headquarters complex | medium |
| mainland campground | in collaboration with MD DNR, would include a master plan and design guidance for development of a new mainland campground | medium |
| water-based access and operations facilities | would include design guidance for development of facilities on the mainland and the island to support water-based access and operations | low |
| backcountry water access points | would include design guidance for development of three new backcountry water access points | medium |
| mainland water access points | in collaboration with Worcester County and other partners, would include design guidance for development of two new mainland points of departure and restoration of adjoining waterfront land | medium |
| staff housing (Maryland) | would include a master plan for expansion of NPS housing on the Maryland mainland and design guidance for new housing units to be added | high |
| staff housing (Virginia) | in collaboration with FWS, would include a master plan for development of NPS housing at the CNWR Virginia Maintenance Facility and design guidance for new housing units to be added | high |

CHAPTER 3

# AFFECTED ENVIRONMENT


**3.1** Introduction ..... 3-1
**3.2** Climate Change/Sea Level Rise ..... 3-7
**3.3** Natural Coastal Processes ..... 3-8
**3.4** Water Resources ..... 3-13
**3.5** Vegetation ..... 3-20
**3.6** Wildlife ..... 3-23
**3.7** Federally Listed Threatened or Endangered Species ..... 3-40
**3.8** Historic Structures ..... 3-47
**3.9** Cultural Landscapes ..... 3-51
**3.10** Wilderness ..... 3-52
**3.11** Seashore Operations ..... 3-56
**3.12** Access and Circulation ..... 3-63
**3.13** Visitor Use and Visitor Experience ..... 3-75
**3.14** Socio-economic Environment ..... 3-86

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# 3. AFFECTED ENVIRONMENT

## 3.1 Introduction

### 3.1.1 SEASHORE CONTEXT

Congress established Assateague Island National Seashore in 1965 as a unit of the national park system (Public Law 89-195). The seashore is located on the Atlantic Coast of the Delmarva Peninsula, encompassing within its authorized boundary Assateague Island and the adjoining waters of the Atlantic Ocean on the east and the estuarine waters of Sinepuxent and Chincoteague Bays on the west, extending up to one-half mile from the island.

Almost all of the land on the island is in public ownership. The state of Maryland owns Assateague State Park, which is managed by the MD DNR. The FWS owns and manages the Chincoteague National Wildlife Refuge. The NPS owns and manages the remainder of the island, with the exception of a few small tracts located primarily in Maryland. Submerged lands within the seashore boundary are owned by the states of Maryland and Virginia, with ownership extending to mean high water in Maryland and mean low water in Virginia.

Approximately two-thirds of the seashore is located within Worcester County, Maryland, and approximately one-third is located within Accomack County, Virginia. Nearby major population centers – long popular with vacationers – include the coastal communities of Ocean City, Maryland, and Chincoteague, Virginia.

Assateague Island National Seashore
**Seashore Purpose**

**The purpose of Assateague Island National Seashore is:**

- to preserve the outstanding Mid-Atlantic coastal resources of Assateague Island and its adjacent waters and the natural processes upon which they depend
- to provide high quality resource-compatible recreational opportunities

### 3.1.2 SEASHORE SIGNIFICANCE

Assateague Island National Seashore possesses resources and values that are important within a global, national, regional, and systemwide context and that are important enough to warrant designation as a unit of the national park system. Four statements express the significance of the seashore's resources and values:

- The seashore is one of the largest and last surviving Mid-Atlantic barrier islands possessing a continuum of intact coastal habitats where the full range of natural processes occur with little or no human interference.
- The marine and estuarine waters within the seashore are a protected vestige of the high quality aquatic ecosystems that once occurred throughout the Mid-Atlantic coastal region of the United States.
- The seashore's habitats support a broad array of aquatic and terrestrial species, many of which are rare, uniquely adapted to life at the edge of the sea, and dependent upon natural ecosystem processes undisturbed by humans.
- Amidst the highly developed Mid-Atlantic region, the seashore's coastal resources provide unique opportunities for nature-based recreation, education, solitude, and inspiration.

Assateague Island National Seashore
**Use of the Term "Seashore"**

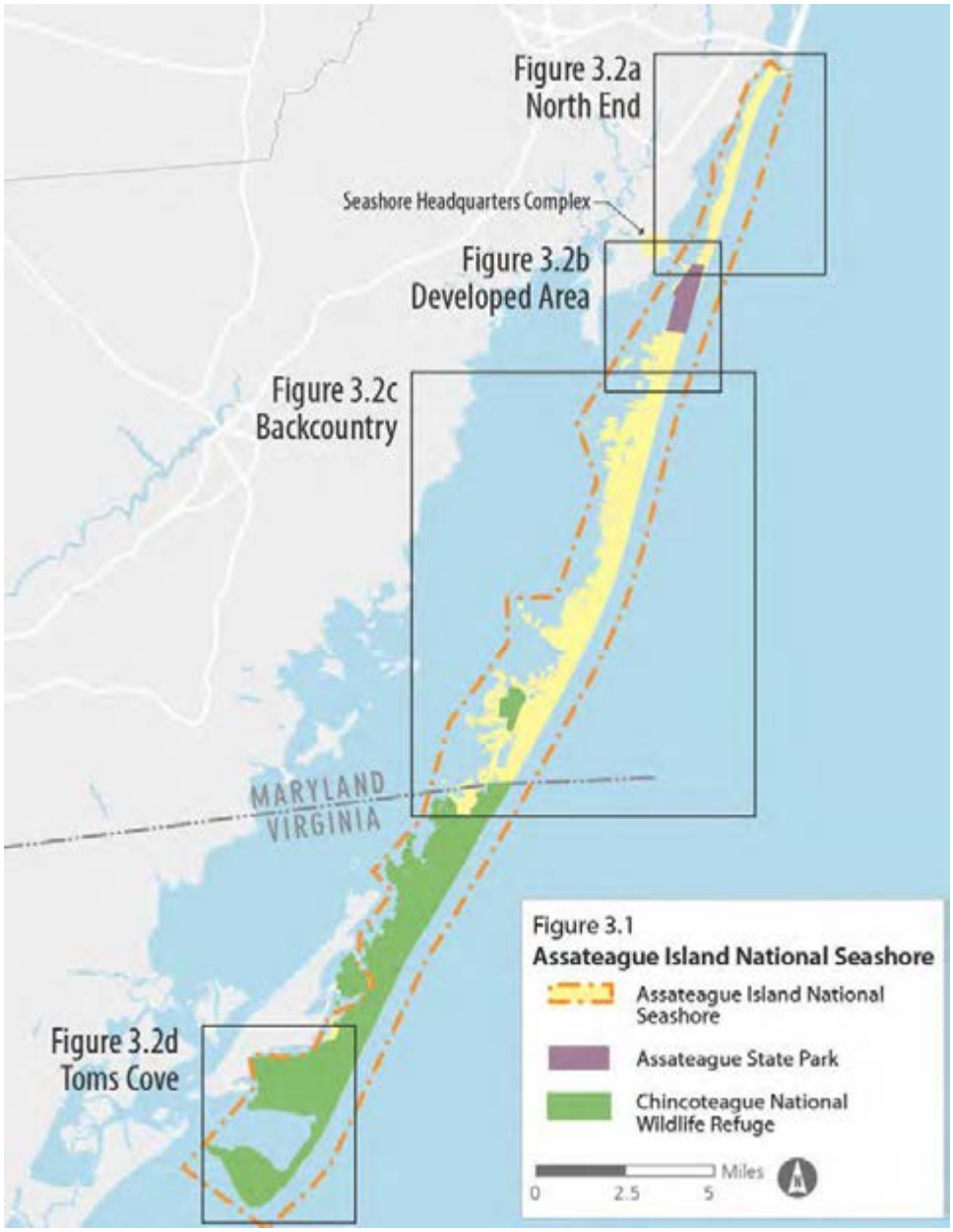
The term "seashore" refers to the following:

- land owned and managed by the NPS within the authorized limits of Assateague Island National Seashore
- waters managed by the NPS within the authorized limits (including waters extending up to one-half mile from the island)

The term "seashore" does not refer to the following:

- land owned by the U.S. Fish and Wildlife Service (FWS) at Chincoteague National Wildlife Refuge
- land owned by the Maryland Department of Natural Resources at Assateague State Park
- submerged lands within one-half mile from the island owned by the states of Maryland and Virginia

The term "Toms Cove Area" refers to the Virginia Assigned Area within Chincoteague National Wildlife Refuge where the NPS currently provides recreation facilities and interpretive programming through a memorandum of understanding (MOU) with the FWS (see section 1.3.2).



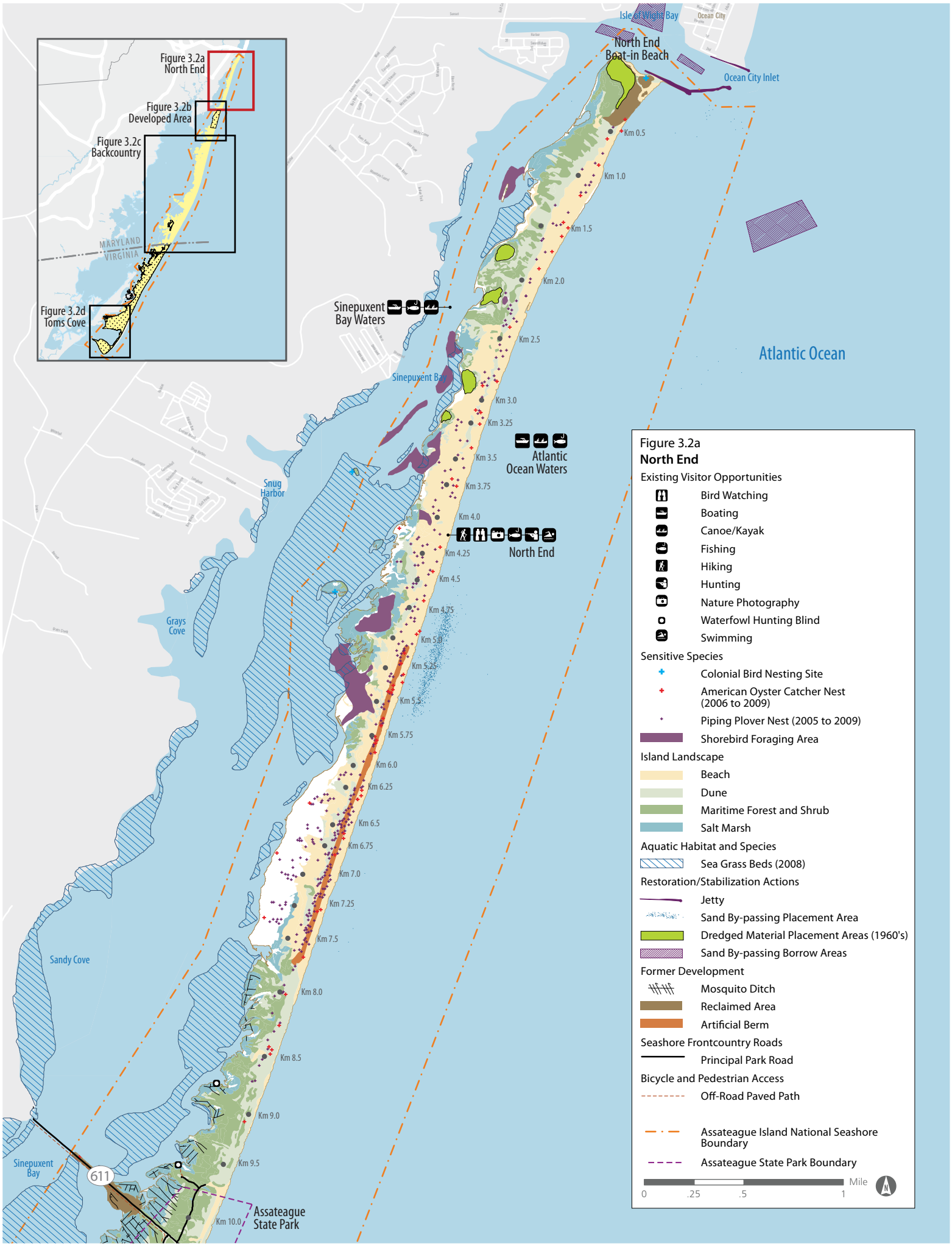


Figure 3.2a
North End
Figure 3.2b
Developed Area
Figure 3.2c
Backcountry
Figure 3.2d
Toms Cove
MARYLAND
VIRGINIA
Isle of Wight Bay
Ocean City
North End
Boat-in Beach
Ocean City Inlet
Atlantic Ocean
Sinepuxent
Bay Waters
Sinepuxent Bay
Atlantic
Ocean Waters
North End
Snug
Harbor
Grays
Cove
Sandy Cove
Sinepuxent
Bay
611
Assateague
State Park
Km 0.5
Km 1.0
Km 1.5
Km 2.0
Km 2.5
Km 3.0
Km 3.25
Km 3.5
Km 3.75
Km 4.0
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Km 7.0
Km 7.25
Km 7.5
Km 8.0
Km 8.5
Km 9.0
Km 9.5
Km 10.0
Figure 3.2a
North End
Existing Visitor Opportunities
Bird Watching
Boating
Canoe/Kayak
Fishing
Hiking
Hunting
Nature Photography
Waterfowl Hunting Blind
Swimming
Sensitive Species
Colonial Bird Nesting Site
American Oyster Catcher Nest (2006 to 2009)
Piping Plover Nest (2005 to 2009)
Shorebird Foraging Area
Island Landscape
Beach
Dune
Maritime Forest and Shrub
Salt Marsh
Aquatic Habitat and Species
Sea Grass Beds (2008)
Restoration/Stabilization Actions
Jetty
Sand By-passing Placement Area
Dredged Material Placement Areas (1960's)
Sand By-passing Borrow Areas
Former Development
Mosquito Ditch
Reclaimed Area
Artificial Berm
Seashore Frontcountry Roads
Principal Park Road
Bicycle and Pedestrian Access
Off-Road Paved Path
Assateague Island National Seashore Boundary
Assateague State Park Boundary
Mile
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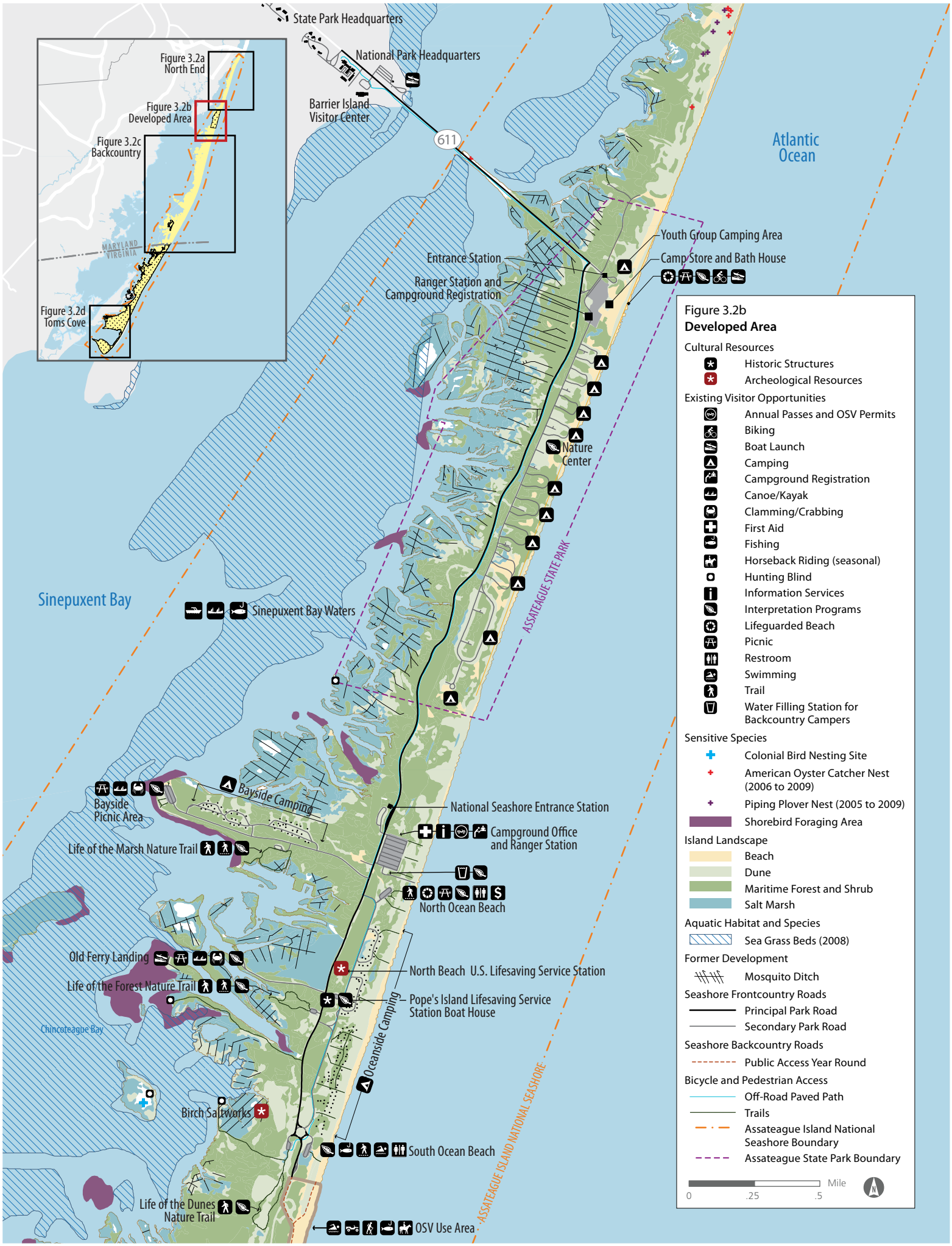
State Park Headquarters
National Park Headquarters
Barrier Island Visitor Center
611
Figure 3.2a North End
Figure 3.2b Developed Area
Figure 3.2c Backcountry
Figure 3.2d Toms Cove
MARYLAND
VIRGINIA
Atlantic Ocean
Youth Group Camping Area
Camp Store and Bath House
Entrance Station
Ranger Station and Campground Registration
Nature Center
ASSATEAGUE STATE PARK
Sinepuxent Bay
Sinepuxent Bay Waters
Bayside Picnic Area
Bayside Camping
National Seashore Entrance Station
Campground Office and Ranger Station
Life of the Marsh Nature Trail
North Ocean Beach
Old Ferry Landing
North Beach U.S. Lifesaving Service Station
Life of the Forest Nature Trail
Pope's Island Lifesaving Service Station Boat House
Chincoteague Bay
Oceanside Camping
Birch Saltworks
South Ocean Beach
ASSATEAGUE ISLAND NATIONAL SEASHORE
Life of the Dunes Nature Trail
OSV Use Area
Figure 3.2b
Developed Area
Cultural Resources
Historic Structures
Archeological Resources
Existing Visitor Opportunities
Annual Passes and OSV Permits
Biking
Boat Launch
Camping
Campground Registration
Canoe/Kayak
Clamming/Crabbing
First Aid
Fishing
Horseback Riding (seasonal)
Hunting Blind
Information Services
Interpretation Programs
Lifeguarded Beach
Picnic
Restroom
Swimming
Trail
Water Filling Station for Backcountry Campers
Sensitive Species
Colonial Bird Nesting Site
American Oyster Catcher Nest (2006 to 2009)
Piping Plover Nest (2005 to 2009)
Shorebird Foraging Area
Island Landscape
Beach
Dune
Maritime Forest and Shrub
Salt Marsh
Aquatic Habitat and Species
Sea Grass Beds (2008)
Former Development
Mosquito Ditch
Seashore Frontcountry Roads
Principal Park Road
Secondary Park Road
Seashore Backcountry Roads
Public Access Year Round
Bicycle and Pedestrian Access
Off-Road Paved Path
Trails
Assateague Island National Seashore Boundary
Assateague State Park Boundary
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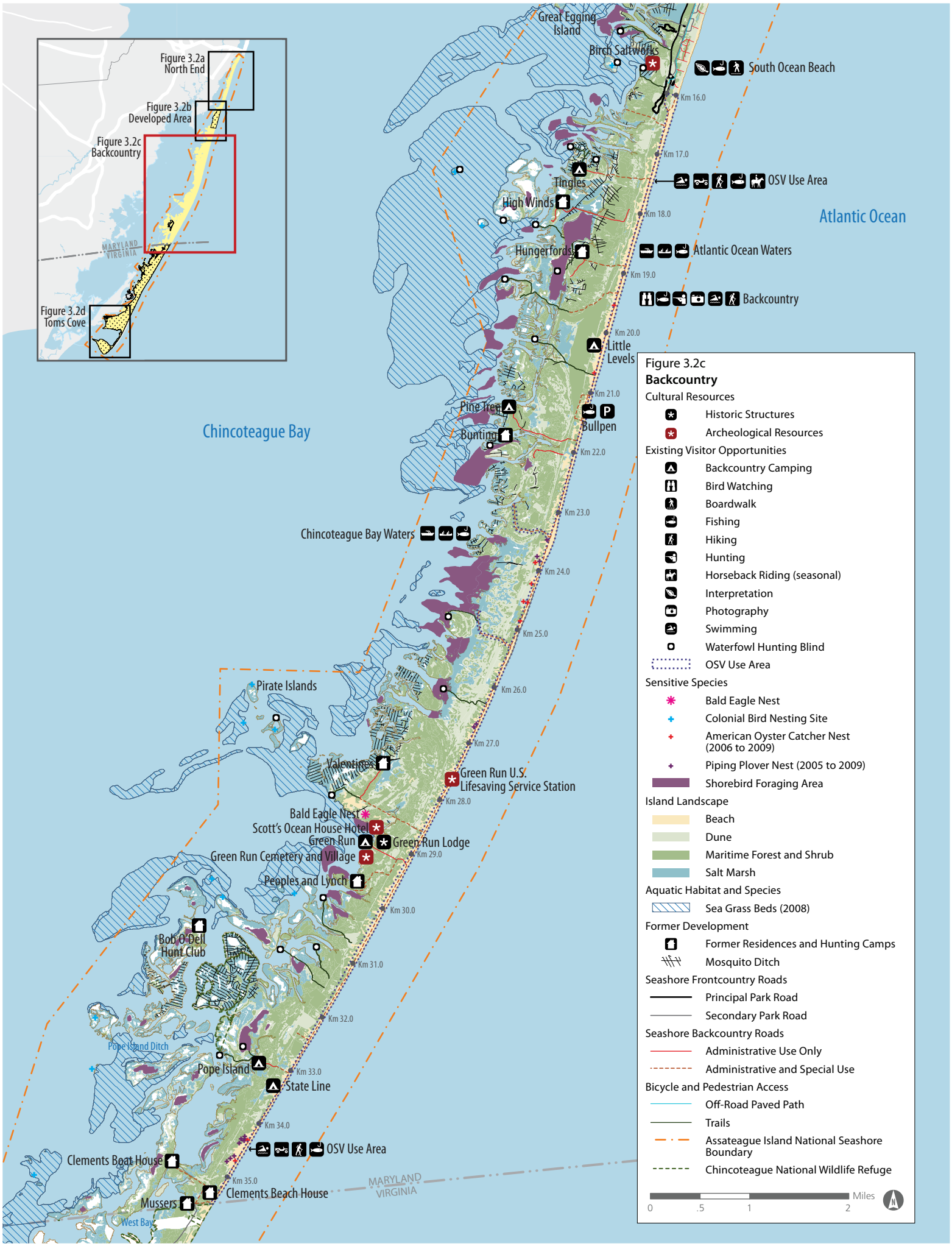
Figure 3.2a
North End
Figure 3.2b
Developed Area
Figure 3.2c
Backcountry
Figure 3.2d
Toms Cove
MARYLAND
VIRGINIA
Great Egging Island
Birch Saltworks
South Ocean Beach
Km 16.0
Km 17.0
OSV Use Area
Tingles
High Winds
Km 18.0
Atlantic Ocean
Hungerfords
Atlantic Ocean Waters
Km 19.0
Backcountry
Km 20.0
Little Levels
Km 21.0
Pine Tree
Bullpen
Bunting
Km 22.0
Chincoteague Bay
Km 23.0
Chincoteague Bay Waters
Km 24.0
Km 25.0
Pirate Islands
Km 26.0
Km 27.0
Valentines
Green Run U.S. Lifesaving Service Station
Km 28.0
Bald Eagle Nest
Scott's Ocean House Hotel
Green Run
Green Run Lodge
Km 29.0
Green Run Cemetery and Village
Peoples and Lynch
Km 30.0
Bob O Dell Hunt Club
Km 31.0
Km 32.0
Pope Island Ditch
Pope Island
Km 33.0
State Line
Km 34.0
OSV Use Area
Clements Boat House
Km 35.0
Clements Beach House
Mussers
West Bay
MARYLAND
VIRGINIA
Figure 3.2c
Backcountry
Cultural Resources
Historic Structures
Archeological Resources
Existing Visitor Opportunities
Backcountry Camping
Bird Watching
Boardwalk
Fishing
Hiking
Hunting
Horseback Riding (seasonal)
Interpretation
Photography
Swimming
Waterfowl Hunting Blind
OSV Use Area
Sensitive Species
Bald Eagle Nest
Colonial Bird Nesting Site
American Oyster Catcher Nest (2006 to 2009)
Piping Plover Nest (2005 to 2009)
Shorebird Foraging Area
Island Landscape
Beach
Dune
Maritime Forest and Shrub
Salt Marsh
Aquatic Habitat and Species
Sea Grass Beds (2008)
Former Development
Former Residences and Hunting Camps
Mosquito Ditch
Seashore Frontcountry Roads
Principal Park Road
Secondary Park Road
Seashore Backcountry Roads
Administrative Use Only
Administrative and Special Use
Bicycle and Pedestrian Access
Off-Road Paved Path
Trails
Assateague Island National Seashore Boundary
Chincoteague National Wildlife Refuge
Miles
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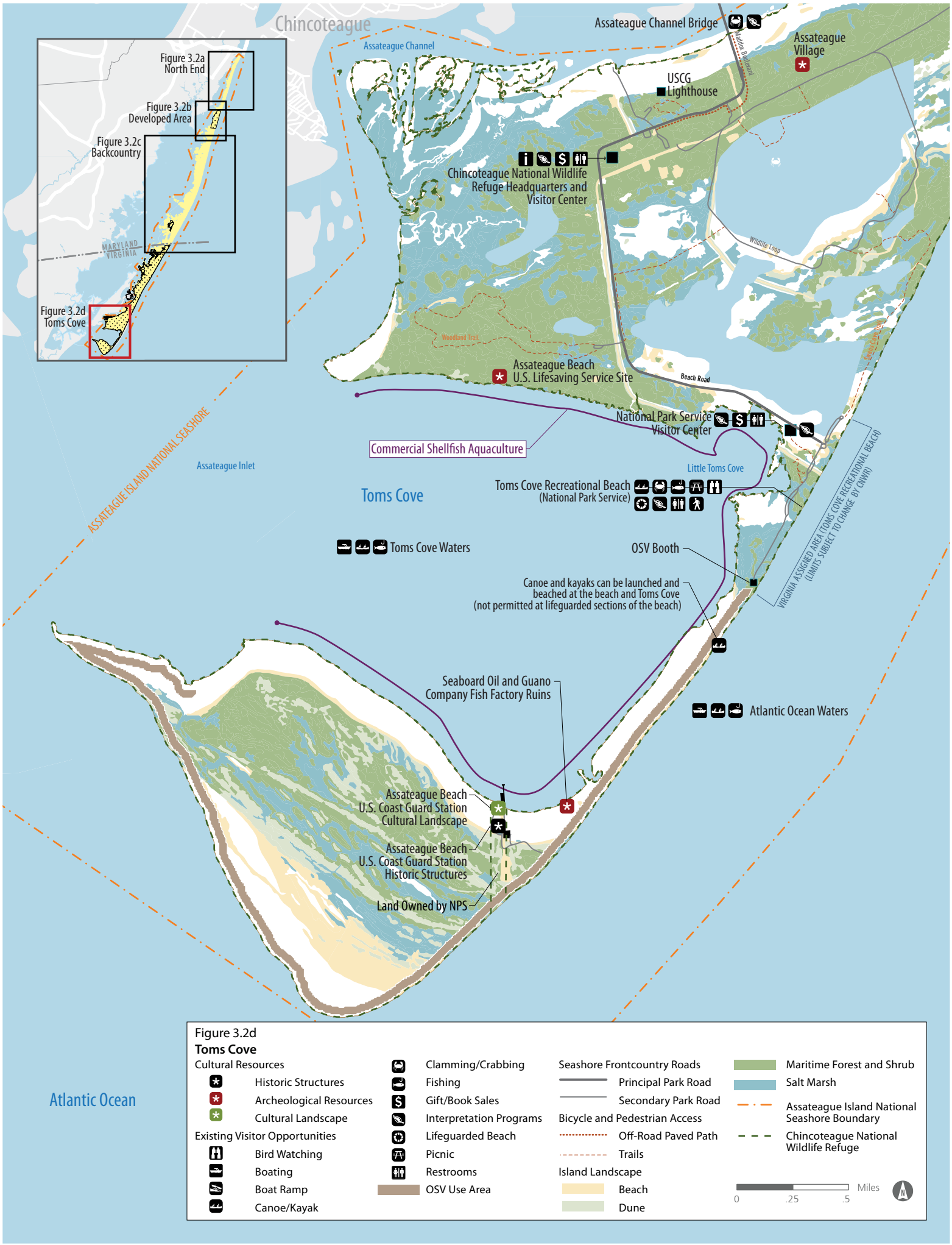
Chincoteague
Assateague Channel
Assateague Channel Bridge
Assateague Village
USCG Lighthouse
Chincoteague National Wildlife Refuge Headquarters and Visitor Center
Figure 3.2a North End
Figure 3.2b Developed Area
Figure 3.2c Backcountry
Figure 3.2d Toms Cove
MARYLAND
VIRGINIA
Wildlife Loop
Woodland Trail
Assateague Beach U.S. Lifesaving Service Site
Beach Road
National Park Service Visitor Center
Commercial Shellfish Aquaculture
ASSATEAGUE ISLAND NATIONAL SEASHORE
Assateague Inlet
Little Toms Cove
Toms Cove
Toms Cove Recreational Beach (National Park Service)
Toms Cove Waters
OSV Booth
Canoe and kayaks can be launched and beached at the beach and Toms Cove (not permitted at lifeguarded sections of the beach)
VIRGINIA ASSIGNED AREA (TOMS COVE RECREATIONAL BEACH) (LIMITS SUBJECT TO CHANGE BY CNWR)
Seaboard Oil and Guano Company Fish Factory Ruins
Atlantic Ocean Waters
Assateague Beach U.S. Coast Guard Station Cultural Landscape
Assateague Beach U.S. Coast Guard Station Historic Structures
Land Owned by NPS
Atlantic Ocean
Figure 3.2d
Toms Cove
Cultural Resources
Historic Structures
Archeological Resources
Cultural Landscape
Existing Visitor Opportunities
Bird Watching
Boating
Boat Ramp
Canoe/Kayak
Clamming/Crabbing
Fishing
Gift/Book Sales
Interpretation Programs
Lifeguarded Beach
Picnic
Restrooms
OSV Use Area
Seashore Frontcountry Roads
Principal Park Road
Secondary Park Road
Bicycle and Pedestrian Access
Off-Road Paved Path
Trails
Island Landscape
Beach
Dune
Maritime Forest and Shrub
Salt Marsh
Assateague Island National Seashore Boundary
Chincoteague National Wildlife Refuge
Miles
0
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## 3.2 Climate Change/Sea Level Rise

The seashore is a highly dynamic place that is constantly changing as currents and storms reshape the landform and its habitats. Most global climate change scenarios indicate that barrier islands such as Assateague will become much more dynamic as a result of accelerating rates of sea level rise, and more intense and possibly more frequent storms. While the pace and magnitude of climate change/sea level rise remains uncertain, it is clear that any plan for the future of the seashore must consider the management challenges associated with an increasingly dynamic island landform.

In 2009, the NPS selected Assateague Island as a case study for exploring climate change scenarios. Researchers identified resource impacts (a range of possible sectors that climate change will likely affect) and climate drivers (the main climatic drivers, such as temperature, precipitation, sea level rise, and drought that are likely to change and hence affect the seashore in the future), and participated in a workshop to explore future scenarios for the seashore. The findings, presented in *Using Scenarios to Explore Climate Change Project Report* (Monitor Group Global Business Network 2009) contributed to the scoping phase of the GMP planning process, providing information regarding how climate change could impact the seashore.

The seashore's natural environment is expected to become less stable under most climate change projections. Driven by increasing rates of sea level rise, and more intense and possibly more frequent storms, the island will experience an increased likelihood for erosion, overwash, inlet breaching, shoreline retreat, and island narrowing. If the highest rates of projected sea level rise occur, the island could exceed stability thresholds, resulting in rapid migration landward, segmentation, and possibly disintegration.

Accelerated landscape dynamics will drive changes in the biotic and abiotic factors influencing the distribution and abundance of existing island habitats. Habitat diversity is expected to decrease, with a trend toward plant species and communities able to tolerate greater and more frequent disturbance from stressors, such as sediment movement and salt water inundation. Community types requiring more stable conditions, such as the island's maritime forests, are likely to decline. Although systems are expected to simplify with a concurrent loss of overall biodiversity, some species will likely benefit, such as shorebirds and other beach-dwelling plants and wildlife.

Anticipated changes in ambient temperature and precipitation patterns will exacerbate the stresses from a more dynamic physical landscape. Although projections regarding overall precipitation are mixed, most suggest that seasonal patterns of rainfall will change, that rainfall will occur in more intense events, and that summer droughts will become more frequent and long lived. Potential impacts to the surficial aquifer from saltwater inundation and a loss of land mass will affect the island's freshwater systems, particularly during summer months. This will likely alter freshwater habitats, threatening a suite of dependent wildlife such as amphibians and waterfowl, as well as the seashore's horses.

Assateague's saltmarsh is also at significant risk from the effects of climate change. Increased rates of sea level rise coupled with a more dynamic landform has the potential to overwhelm the ability of intertidal marshes to maintain surface elevations and keep pace with rising seas. Significant loss of saltmarsh will decrease primary productivity and reduce habitat availability for both terrestrial and aquatic species; some of which are important to regional commercial fisheries.

Rising temperatures and summer drought are also expected to worsen conditions in the estuary formed by Assateague Island by stimulating algal production and increasing anoxia. Estuarine resources already stressed by excess nutrient loading from land uses and development in the mainland watershed are particularly vulnerable. Temperature sensitive aquatic grass species such as *Zostera marina* are likely to decline; a loss that could stimulate wholesale ecological change.

From a visitor use perspective, the more dynamic barrier island landform expected under most climate change projections will challenge the NPS's ability to provide recreational access and opportunities in traditional ways. Rapid rates of shore retreat and storm driven overwash will make fixed location of infrastructure, such as roads, parking lots, and visitor use facilities, increasingly more difficult and costly to maintain. NPS will need new ways of providing sustainable access and infrastructure to protect visitor use opportunities in the face of climate change.

## 3.3 Natural Coastal Processes

Assateague Island National Seashore
**Fundamental Resources – Natural Coastal Processes**

Natural processes including the action of tides, wind, waves, currents, storms, and sea level rise, influence and shape the barrier island and adjacent aquatic habitats.

Assateague Island is one of many low lying, floodprone, and highly dynamic barrier islands along the east coast. What is today Assateague Island was originally part of Fenwick "Island." Although referred to as an island, Fenwick is actually a barrier spit attached to the Delaware-Maryland-Virginia (Delmarva) Peninsula. In 1933 a hurricane washed over Fenwick Island forming an inlet (now known as Ocean City Inlet) and creating Assateague Island as a distinct barrier island encompassing the southern 37 miles of what was Fenwick Island. Since that time, stabilization with jetties and routine dredging by the USACE has maintained and enlarged the Ocean City Inlet to provide water access between the Maryland coastal bays and the Atlantic Ocean.

Assateague Island National Seashore
**Fundamental Resources – Natural Coastal Environment**

The natural coastal environment of the seashore exemplifies the meeting place of land and sea along the Mid-Atlantic coast, and includes miles of broad sandy beaches, an intricate mosaic of natural and scenic landscape features, and qualities of wilderness character.

The Delmarva Peninsula began forming during the Pliocene and early Pleistocene (up to about 1.5 million years ago) as the ancestral Potomac River and Delaware River deposited deltas and outwash plains that would become the peninsula's core (Schupp 2006). Glaciers deposited sediments into major river systems to form a broad coastal plain, and sea level lowering allowed cutting of river valleys and creation of Delaware Bay and Chesapeake Bay. About 18,000 years ago after the last glacial period of the Pleistocene epoch, sea level began to rise, sea water covered the coastal plain, and barrier islands migrated shoreward. Glacial meltwater continued to carry large volumes of sediment to the sea. About 3,500 years ago sea level rise began to stabilize, and waves shaped sediments along the margins of the evolving shoreline and connected barrier features known today.

**Table 3.1. Assateague Island National Seashore – Climate Change Projections[1]**

| | General Change Expected | Range of Change Expected and Reference Period | Size of Expected Change Compared to Recent Changes | Synoptic Signs | Confidence |
|---|---|---|---|---|---|
| temperature | increased temperature, but not uniform | 1.0 to 1.9°C (1.8 to 3.5°F) increase by 2040 | moderate to large | trend to milder winters with lengthening periods of above freezing temperatures | virtually certain that temperature will increase; projections for rate and magnitude of change vary, but forecasts consistently call for an ecologically significant rise in temperature |
| precipitation | probable decreased total annual precipitation | 1 to 6% increase in cold half by 2040; 3 to 7% decrease in warm half by 2040 | small to moderate; most changes within the bounds of the observed record | wetter springs and autumns are a signal of more active mid-latitude cyclones | low confidence – model trend is toward drier during the warm season, but this runs contrary to the decadal shift toward more precipitation |
| sea level | increased sea level | 3.5 to 9 inches (80 to 220 mm) by 2040 | large | when coincident with lunar phase, nor'easters and hurricanes will enhance floods; increased flushing into coastal bays | very conservative – moderate degree of confidence though it may take some alignment of storms, tides and winds to have a large scale effect |
| drought | modest increased drought frequency during the warm season | rainfall deficits during the growing season may approach 10 to 25%; more frequent dry spells by 2040 | small to moderate | greatest impacts during summer; some effects on Delmarva crops; likely to lower flows into estuaries (increased toxin concentrations) | modest level of confidence – will be largely influenced by regional and sectional droughts which are driven by thermal anomalies on the continent and adjacent oceans |
| snow cover | increased snow-free days; decreased snow accumulations | up to >50% reduction in average annual snowfall by 2040 | moderate | shift in winter storm tracks away from coastal development | high level of confidence – it matches current trend (note that 'odd' extreme snowfalls are likely) |
| length of growing season | increased length of growing season | likely to be two or more weeks longer by 2040 | moderate to large | more large scale stagnant high pressure systems during spring and fall | high degree of confidence – synoptic patterns will also allow the occasional late/early freezes |
| extreme events: temperature | warm events increased; cold events decreased | record minimums less likely in winter by 2040; record maximums more likely in winter by 2040 | moderate | increased frequency of thaws in winter as seen by emergence of subtropical high | moderate to high degree of confidence – it continues existing trend (greatest increase in summer heat occurs later in the period) |
| extreme events: precipitation | possible decreased frequency of heavy rain; countered by increased intensity of precipitation | uncertain | moderate | potential for more intense spring and autumn floods due to active storm tracks | model forecasts show the least skill in precipitation forecasts, though repetitive storms are a common way for excessive precipitation |
| extreme events: cold season storms | increased intensity of cold season extreme events | uncertain | moderate to large | increased frequency of transition season storms (nor'easters) | low to moderate confidence |
| extreme events: warm season storms | increased intensity of warm season events; possible decreased frequency of warm season storms | uncertain | moderate | increased strength of tropical storms; possibility of two storm strikes in short time scale | low confidence |

[1] *Table Adapted from A1B Scenarios (Meehl et al in Solomon et al 2007 and Christensen et al in Solomon et al 2007)*

Features such as Fenwick and Assateague spits developed from continued shaping of sediments washed out from the Delaware River basin through forces such as coastal currents, waves, and tidal action. Because Assateague and Fenwick are in an area where tidal change is relatively small (up to six feet, considered "micro-tidal"), other forces such as currents, sea level rise, and wave energy during storms generally shape barrier features.

Today, Assateague Island extends 58 km (37 miles) along the coasts of Maryland and Virginia, ranging in width from 300 m to 1200 m (Schupp 2006). Elevations are generally around 2 m, although dunes may be as high as 10 m. The north end is bounded by the Ocean City Inlet which has an associated flood tidal delta and a large ebb tidal delta that extends both north and south of the inlet, curving to form a 300 m wide attachment bar that currently meets the shoreline between 650 and 950 m south of the inlet (Schupp et al 2006). Winter storms and high wave energy create a low, flat beach with sand stored in a nearshore sand bar, although waves and wind can create a steep scarp at the dune face further inland. Summer beach profiles are steeper (Shupp et al 2006).

Ocean waves and storms constantly reshape barrier islands through erosion and accretion. Waves strike the shore at an angle creating a longshore current that travels parallel to the shore. Longshore currents carry sediment along the shore in a process called littoral drift and deposit it where wave energy is lower. At Assateague, the longshore current moves sediment from north to south in the winter, generally following the direction of the area's largest waves from the northeast. On average 200,000 to 300,000 yd³ of sediment per year are moved along the coast through longshore transport. This sediment movement and deposition stretches out barrier

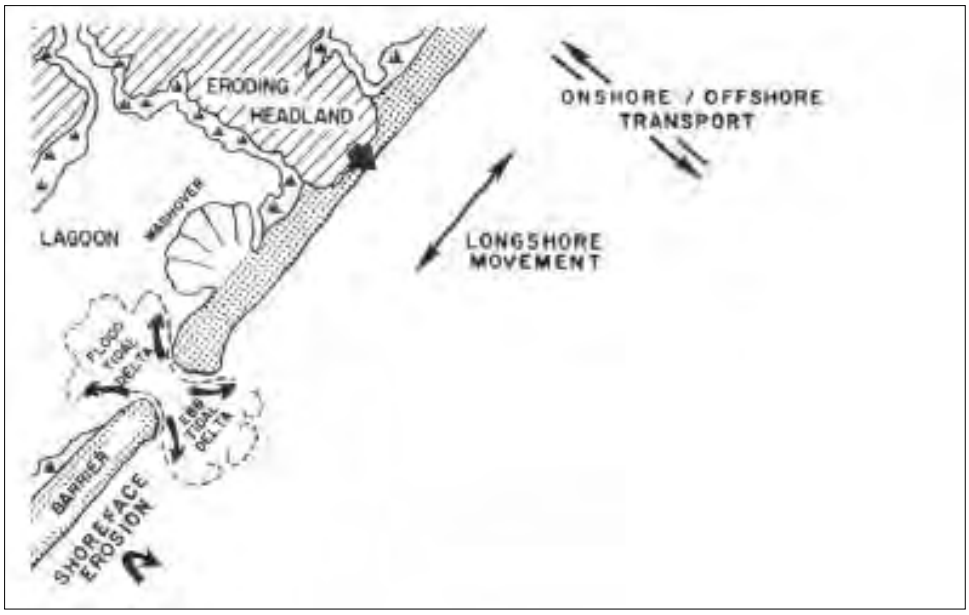



**Figure 3.3** General barrier Island geomorphic processes, including current, sediment transport, overwash, and inlet flood tidal formation

features, which become elongated and even curved by accreting sand on the downdrift end (USACE 2009). In the summer waves from the southeast drive sand transport less vigorously northward. As a result the net annual longshore transport is estimated to be between 115,000 and 214,000 m² per year toward the south (Underwood et al 2005 as cited in Schupp et al 2006).

In addition to currents, waves moving perpendicular to the shore help shape the island. When waves are particularly strong they can erode sand from the beach and dunes and carry it across the island. This process of "overwash" deposits sand in the island interior or carries it across the island and deposits it in the bay, keeping the island rolling over itself toward the west, essentially moving away or "retreating" from wave activity. Overwash helps maintain the land base of the island as well as its height in the face of rising sea level. It increases during sea level rise and helps the island resist flooding and erosion associated with sea level rise and more frequent or severe storms that would otherwise erode, flood, and eventually submerge it (USACE 2009).

Barrier islands are also subject to the formation of new inlets, which can form during high energy storm events (e.g. hurricanes or nor'easters). When an inlet opens, sediment is transported by currents and tidal action into the bay or lagoon that separates Assateague Island from the mainland. This creates a flood tidal delta. On the island, saltmarshes vegetated primarily by salt tolerant grasses such as cordgrass (genus *Spartina*) fringe the bays. Over time, continued longshore transport of sediments closes the inlet and the flood tidal delta often evolves into substrate suitable for the development of new saltmarsh. New vegetation grows and dies, its decay adding to the bayside land area, moving the shoreline closer to the mainland and creating needed elevation to withstand increasing sea levels (USACE 2009).

**Figure 3.4** Accelerated erosion caused by jetties, groins, and other efforts to stabilize the Ocean City Inlet (particularly at the northern end Assateague Island) (photo taken in September 2004)

The dynamics of shoreline accretion or erosion change from winter to summer. In the winter more forceful waves and wind remove sand from the beaches. The eroded sand is deposited in offshore sand bars and returns to the beaches with gentler summer waves. Because there are more days of low energy waves than high-energy waves, accretion balances erosion (USACE 2009).

The environments on Assateague Island include the nearshore (subaqueous zone), beach (foreshore and backshore), dune, grasslands and shrub/scrub thickets, freshwater ponds, and forest. Where the island is narrow or lower in elevation and subject to persistent overwash, barrier flats, sparse vegetation, and wetlands replace the forested areas. The beach and dune habitats are particularly important to the island's geomorphology because they provide protection from wave attack and absorb wave energy (NOAA Coastal Services Center as cited in USACE 2009).

Human development including jetties and groins can substantially alter the coastal dynamics of the barrier island. In the future, beaches along the east coast are expected to become increasingly vulnerable to storms in part because of the "hardening" of the coastline, a term that refers to the addition of jetties, groins and other stabilizing structures which dramatically stop or slow littoral transport down-current of the structure (Munger et 2010). Following the August 1933 storm that separated Assateague Island from the Fenwick barrier spit, stabilization efforts to keep the inlet permanently open began. USACE built jetties both north and south of the inlet. This caused a dramatic effect on down-current sediment supply to Assateague Island. The jetty-caused sediment deficit has resulted in unnaturally accelerated rates of shoreline erosion along northern Assateague Island.

The U. S. Geological Survey (USGS) has rated the northern 13 km of the island as having "very high vulnerability" to erosion and loss, thought to be caused primarily by the interruption in longshore sediment transport created by the jetties (Rosati et al 1996, as cited in Schupp et al 2006). The lack of sand has removed the buffering ability of the beach, with resulting low elevation, frequent over washing, and high rates of shoreline erosion (Pendleton et al 2004 as cited in Schupp et al 2006). Along this stretch, the shoreline erosion rate more than doubled since the inlet was created, from a pre-inlet rate of -1.5 m per year to a post inlet rate of -3.7 m per year, translating to an estimated loss of sediment volume on the order of 220,000 $m^3$ per year (Schupp et al 2006). The USACE has predicted that without mitigation the north end of the island will destabilize and eventually breach during storms in the near future.

To maintain both the inlet and the geologic integrity of northern Assateague, local and national government agencies have created a comprehensive two-phase restoration plan (as described in Schupp et al 2006). The first phase placed 1.4 million $m^3$ of sand just seaward of the mean high water line in September 2002 in an area extending from 2 to 12.5 km south of the inlet. The second phase is longer-term (25 years) and is intended to restore sand transport to northern Assateague Island at the historic, pre-inlet rate. Since January 2004, the USACE had dredged approximately 72,000 $m^3$ of sand

twice yearly from the ebb and flood tidal deltas and deposited it just seaward of the surf zone off the island's north end. The "bypassed" sand re-enters the longshore transport system and nourishes the down-current beaches, thereby helping to reduce the rate of current shoreline erosion on the beaches of Assateague Island. An assessment following the first two years of the bypass project concluded that, overall, the project has been effective in delivering sand to the surf zone and shoreline of north end of the island.

## 3.4 Water Resources

### 3.4.1 NEARSHORE OCEAN WATERS

Assateague Island National Seashore
**Fundamental Resources – High Quality Waters**

High quality water resources within the seashore's boundary define and sustain the coastal ecosystem and include fresh ground water and surface water systems, and extensive estuarine and marine waters.

Along the length of Assateague Island, 14 percent of the land area is beach and intertidal habitat on the Atlantic coast. This is the least studied habitat of lands and waters managed by the seashore and there is less knowledge of habitats, geomorphic processes, or water quality conditions. However, the NPS does sample ocean water quality several times during the summer, particularly to assess whether EPA water quality standards for the presence of human fecal material (presence of enterococci bacteria as an indicator). High levels of bacteria, which can indicate the presence of pathogens from animal or human waste, are responsible for the overwhelming majority of beach closures and advisories in the nation. Causes can include inadequate or overloaded sewage treatment plants, polluted stormwater runoff, or faulty septic systems. From 2009 to 2011 only one exceedance of EPA standards was recorded at the seashore. This occurred at Toms Cove North on September 7, 2010, following Hurricane Earl which had passed through the area a few days previously.

### 3.4.2 COASTAL BAYS

- **Chincoteague Bay,**

Assateague Island National Seashore
**Fundamental Resources – Related Resources**

The waters and mainland watershed of Chincoteague and Sinepuxent Bays and Atlantic Ocean extend far beyond park boundaries. The integrity of many fundamental resources is affected by activities that occur outside of the park, but within the watershed.

Chincoteague Bay is the largest and most southern of the two seashore bays partially within the seashore boundary. It has a surface area of 363 $km^2$ (including 189 km2 in Maryland and 174.5 $km^2$ in Virginia) and a water volume of 231$m^3$. Most of the bay is shallow, with an average depth of 1.22 m. Major sources of sedimentation to the bay are storm overwash events and shore and wind erosion from Assateague Island, with streams providing relatively little contribution. River input to all Maryland coastal bays is low and groundwater is a more important source of freshwater. Flushing (replacing all water through freshwater exchange and ocean exchange) rate for Chincoteague Bay is slow, on the order of 63 days; contaminants that enter the bay tend to stay in the bay and can have a disproportionate effect on water quality and aquatic life compared to larger, deeper bays such as the Chesapeake Bay.

- **Sinepuxent Bay**

Sinepuxent Bay has a surface area of 24.1 $km^2$ and an average depth of only 0.67 m. Sinepuxent Bay volume is 16.5 million $m^3$. While the flushing rate is unknown, it is likely quicker than Chincoteague Bay owing to its proximity to the Ocean City Inlet.

- **Newport Bay**

Newport Bay, not part of the seashore, is connected to and influences Chincoteague Bay. It is small and shallow, with a combined volume of 19.4 million $m^3$, average depth of 1.22 m and surface area of 15.9 $km^2$.

- **Coastal Bay Water Quality**

The *2004 State of the Bays Technical Report* (Wazniak et al 2004) provides an overview of water quality conditions for each of the bays. Results of monitoring vary from bay to bay, with Newport Bay failing to meet nitrogen and phosphorus standards needed for the protection of seagrass, a critical component of the aquatic ecosystem. While monitoring generally indicated water quality in Sinepuxent Bay met the nitrogen standard, three of five stations actually exceeded the phosphorus standard. In Chincoteague Bay four northern mainstem stations did not meet nitrogen standards, but 13 stations on the eastern side of the bay behind the seashore did. Enrichment with phosphorus was more widespread; all four sites that did not meet the nitrogen standard also failed to meet that for phosphorus. Of the 17 stations where sampling data were summarized, four met the phosphorus standard; these were located on the eastern shore of the bay. Public Landing, Johnson Bay and a site north of Chincoteague Island had the highest phosphorus concentrations (Wazniak et al 2004).

Chlorophyll testing, which measures the density of phytoplankton in the bays, has also been completed. If chlorophyll levels are lower (than 15 µg/L), seagrass receives more light and is better able to grow. Test results have shown that most of Newport Bay and Sinepuxent Bay had chlorophyll levels that were greater than the threshold for seagrass growth, although all of those tested in Chincoteague Bay were at or lower than the density needed to grow seagrass. The area in Chincoteague Bay covered by seagrass more than tripled between 1987 and 2001, but has since leveled off (Harris et al 2005). This leveling off and the observation of large patches of former seagrass beds showing a complete loss of plants and dead rhizomes suggest phosphorus and nitrogen enrichment, dissolved oxygen, and other unknown factors may be also playing a part in seagrass changes in the bay and appear to indicate ecosystem level changes may be ongoing.

A water quality index developed by Wazniak and Carruthers (2004) that synthesized several factors including nutrient loading, chlorophyll concentration, and dissolved oxygen applied to Sinepuxent, Newport, and Chincoteague Bays, found Sinepuxent had overall good water quality with only slightly reduced quality in the north from failure to meet phosphorus standards. Water quality in Newport Bay was generally poor, with

most sites in degraded or very degraded conditions. Water quality in certain areas of northern Chincoteague Bay was poor due to nitrogen and phosphorus levels, particularly in John's Bay and the Public Landing area (Fertig et al 2006). All sites passed chlorophyll and dissolved oxygen thresholds and some sites had good to excellent water quality.

A later study (Wazniak et al 2007) offered a different viewpoint on water quality in the bays by analyzing nutrient concentration data using a non-linear statistical test. Overall the authors found that while traditional linear trend analysis would indicate water quality conditions were improving, non-linear trend tools found the majority of sampling stations in Chincoteague and Sinepuxent Bays have experienced worsening conditions recently. Rather than a simple linear decrease in pollutants, they indicated a "U" shaped trend where nutrients began to increase during the period 1995 to 2000. Although seagrass coverage did increase from 1995 to 1999, it decreased in 2000 and leveled off from that point on; the authors suggest this leveling off may indicate the point where increasing nutrients and chlorophyll began to affect seagrass abundance. They warn that efforts to protect from increasing pollutants are needed and that seagrass abundance may decline without them. Sources of particular concern include inputs from large animal operations near streams including historic organic nitrogen fertilizers, phosphate-rich poultry manure, and sewage.

Sediments in the bays do not contain high levels of contaminants and concentrations of most metals are within background levels. Most organic contaminants are at trace levels or below detection limits (Wells et al 2004).

A recent seashore-specific study of water quality in the bays, sampling of benthic sediments, and collection and analysis of oyster tissue studies concluded that there are no organic compounds that would be at levels high enough to adversely affect seashore benthic communities or wildlife (NPS 2010a). However, given that agricultural practices, including poultry production, continue in the watersheds that feed the Maryland Coastal Bays the authors indicate monitoring should continue. Poultry farming, use of pesticides, and other activities have produced higher levels of several heavy metals such as chromium and arsenic, silver, and mercury, as well as harmful organics that are potential concerns for some aquatic wildlife, such as filter feeding organisms like shellfish or predators that bioaccumulate metals and other pollutants through the food chain.

Three industrial and four wastewater treatment facilities (including the seashore's facility on the mainland) discharge 8,000 gallons per day on average into the coastal bays. These and other identifiable point sources account for only an estimated 5 percent of the pollutant load (Boynton et al 1993 as cited in Wazniak et al 2004). Analysis of nitrogen and phosphorus data from 2001 to 2003 indicates that non-point sources contribute the majority of pollutants entering the bay system. (Wazniak et al 2004). Nonpoint sources include fertilizer, animal waste, atmospheric deposition, septic systems, and natural sources such as wetland, marsh, and forest vegetation. Nitrogen in

the groundwater contributes a substantial load of nitrogen to the coastal bays, which could be on the order of 123,400 kg/year, or nearly one-quarter of the direct discharge into the bays (LaMotte et al 2007). The seashore's wastewater treatment facility discharges approximately 120 kg of total nitrogen per year into Sinepuxent Bay (NPS 2003a).

Assateague water quality and hydrology is also affected by the presence 48,000 meters of ditches originally created to drain the marsh of standing water and reduce the potential for mosquito breeding (see figures 3.2a, 3.2b, and 3.2c). An estimated 90 percent of these ditches remain unfilled today. Although they proved ineffective in controlling mosquitoes (NPS 2011d), they did increase the drainage capacity of the marsh, which in turn reduced the duration of inundation by overwash, rainwater, or particularly of tidal flooding. Instead, water and sediment were trapped in the series of linear channels, where other studies indicate it may become stagnant and accumulate both inorganic and organic nutrients and coliform bacteria (Koch and Gobler 2009 as cited in NPS 2011d). Sediment deposition on the marshes is likely reduced as a result of the channels, affecting an important process required to withstand the effects of sea level rise. Rather than depositing sand in the marsh, it accumulates in the ditches (LeMay 2007). One study (Adamowicz and Roman, 2005 as cited in LeMay 2007) found that ditches cause the marsh to drain differently than those without them, as marsh areas with only creeks (even a high number of creeks) maintain a much higher area of standing water, including water in ponds. Marshes that have been restored at the seashore are currently draining in a more natural manner, with sheet flow occurring at the high tide cycle and similar to other restoration projects (Roman and Burdick 2012).

### 3.4.3 WETLANDS

The seashore includes approximately 4,700 acres of wetlands, including seasonal pools that are wet only in the spring (vernal pools).

Estuarine fringe and coastal loblolly pine forests lie west of the bay dunes in depressions intersecting the groundwater table. Estuarine fringe is considered a palustrine wetland (or inland wetland of standing water) and is characterized by a closed to partially open canopy with an understory of vines that can cover the lower branches of trees. The coastal loblolly pine forest includes scattered deciduous trees and some shrubs.

A common invader particularly of freshwater maritime shrub wetlands indicative of human disturbance is *Phragmites australis*, also called the common reed or red grass, a species that can tolerate a large range of salinities from fresh to brackish. Dense stands of *Phragmites* can overwhelm native plant communities, grow in colonies of tall leafy plants often to the exclusion of other vascular plants. It is considered an invasive species. Although *Phragmites australis* rhizomes have been found in saltmarsh sediments of the Mid-Atlantic dating to 3000 years and older, the invasive version creating problems throughout the region is believed to have been introduced from Europe during the 19$^{th}$ century.

On the bayside of the seashore vegetation is associated with fresh, brackish, or saltmarsh. Soils of deep muck form and vegetation occurs either in standing water or where groundwater is close to the surface.

Brackish tidal marsh dominated by narrow-leaved cattail (*Typha angustifolia*) and rose mallow (*Hibiscus moscheutos*) occurs where salinity is 0.5 to 18 ppt usually at the edge of non-tidal intermittently flooded wetlands. This community is not widespread at the seashore.

The much more common higher elevation marsh at the seashore, or high saltmarsh, is irregularly flooded by the brackish waters of Chincoteague or Sinepuxent Bays. High marsh covers extensive areas of the bayside of the seashore. Saltmeadow cordgrass (*Spartina patens*) covers 75 to 100 percent of the ground where it occurs. The substrate is peat overlying sand.

On the border between high saltmarsh and adjacent upland is salt scrub, characterized by dense shrubs and a shallow layer of peak overlying sand or loam.

Low saltmarsh which is lower in elevation than high saltmarsh occurs on the bayside between mean sea level and mean high water level on peat soils ranging widely in depth. Brackish water from the bays irregularly to regularly floods this estuarine community. Saltmarsh cordgrass (*Spartina alterniflora*) and *Ascophyllus nodosum* are the dominant species of this moderate salinity zone. Saltmeadow cordgrass (*Spartina patens*) alone often covers 50 to 80 percent of low saltmarsh.

Within high and low saltmarsh, salt panne, a community of low growing forbs, develops in shallow depressions where drainage is poor and water evaporates forming salt pannes. Species include saltwort (*Salicornia spp*.), saltwater cordgrass (*Carcocornia perennis*), and saltmarsh cordgrass (*Spartina alternifolia*). At the seashore the low forb vegetative community takes shape as large sparsely vegetated circular flats or depressions within the low saltmarsh community. Vegetation is sparse except for a dense blue-green algae mat that develops late in the summer. Needle brush marsh which is dominated by species of reeds (*Juncus spp*.) occurs on sandy substrates within both high and low saltmarshes of the bayside.

- **Current conditions**

Inland wetland habitats of the seashore were recently assessed by NPS biologists as being in “fair condition” (NPS 2011d). Impacts to inland wetlands include the effects of invasive plants such as *Phragmites australis*, horse grazing, trampling, and addition of nitrogen and sulfate from air sources outside the seashore and accompanying decreases (e.g. acidification) in pH. Saltmarsh habitat is characterized by the seashore in its *Natural Resource Condition Assessment Report* (NPS 2011d) as “degraded”. This is a result of forces with cumulative effects including grazing and trampling by horses, existing mosquito ditches, erosion of bayside shoreline resulting in the loss of habitat,

nutrient addition, and barriers to natural overwash such as man-made dunes and berms (NPS 2011d).

On the western side of the seashore low and high saltmarsh dominate. Saltmarsh is subject to seasonal changes in salinity as well as daily changes in water levels resulting from the ebb and flow of tidal action twice a day. Some species are irregularly flooded during very high tidal cycles and some are continuously inundated. The network of mosquito ditches created during the 1930s and 1940s has altered the natural hydrology of the low saltmarsh by increasing the amplitude and timing of tidal flooding. Sampling at the seashore during 2008 recorded twenty-seven vegetation species at nine saltmarsh sites (NPS 2010g). No species were listed as rare, threatened, endangered, or exotic or invasive by state or federal agencies. Saltmarsh cordgrass (*Spartina alterniflora*), saltmeadow cordgrass (*Spartina patens*), and spikegrass (*Distichlis spicata*) were the most prevalent species found during this sampling effort.

About 1,600 acres of inland freshwater wetlands occur at the seashore. These are palustrine wetlands found in low swales of the dune systems that are associated with a shallow groundwater table often with intermittent pools of standing freshwater with no source of inflowing water (such as a stream or river). They are characterized as estuarine fringe or coastal loblolly pine forests, sand bog, shrub bog, inland red maple swamp, and maritime shrubland.

The seashore's wetland systems provide important habitat for several species of wildlife, including nurseries for fish, nesting, feeding habitat for waterfowl, and habitat for insects, amphibians, and aquatic reptiles. Saltmarshes provide biomass which supports the estuarine food web as a base for both herbivores and detritovores who feed on decayed vegetative material drifting to the bottom. Freshwater pools or ponds, while intermittent across the island, are an important source of water for plants and animals.

Although much of the wetland system is in good condition, horse grazing has affected low saltmarsh plants particularly, as these are among the preferred species for horses. High marsh species, including spikegrass (*Distichlis spicata*) and saltmeadow cordgrass (*Spartina patens)* are more prevalent in low saltmarsh than under more natural conditions (e.g. without horse grazing). While high marsh plants take advantage of the available low marsh habitat, they are also susceptible to damage from inundation. Over time high marsh plants in what is traditionally lower marsh habitat can die off during high water periods and leave open mud flats or pools, habitats that do not have the same high value to wildlife. This is exacerbated by changing sea level, which is expected to continue to rise and inundate both low and high saltmarsh more frequently in the coming years.

### 3.4.4 PONDS

Assateague Island has hundreds of natural ponds, which are fed and drained by groundwater seepage and which range in salinity from fresh to near ocean salinity.

Many of the ponds were formed when an erosional process, usually associated with an overwash event cut down through the surface sediment to a base below the water table. The character of individual ponds varies dramatically depending upon the position on the island and the thickness and dynamics of the fresh groundwater lens (Krantz 2009). Salt spray, overwash and surface flow of seawater, inflow of saline groundwater from up-gradient and flooding from the bayside are the four mechanisms responsible for fluctuating salinity levels in the ponds (Hall 2005). Ponds near the center of the seashore that are higher and more protected from overwash from the ocean are most likely to be freshwater; the higher elevation physically protects them and creates higher hydraulic head within the freshwater lens preventing subsurface encroachment of brackish groundwater. Ponds are the only source of freshwater on the island.

### 3.4.5 FLOODPLAINS

Assateague Island is entirely within the 100-year floodplain, as shown on Federal Emergency Management Agency Flood Insurance Rate Maps (FEMA 2009 and 1992). The Federal Emergency Management Agency defines geographic areas as flood zones according to varying levels of flood risk. Each zone reflects the severity or type of flooding in the area. On Assateague Island, “V zones” occur adjacent to the ocean shore and some areas of Chincoteague Bay; these are areas of 100-year coastal flood with velocity (wave action) where base flood elevations and flood hazard range from 12 to 13 feet in the beach and dune areas along the ocean and 9 feet in some bay shore areas in Chincoteague Bay. “A zones” occur along the length of the island behind the dunes; these are areas of 100-year coastal flood that are not subject to wave action where base flood elevations are generally 8 to 9 feet.

The mainland area in the MD 611 corridor is generally within an “A zone” where the base flood elevation is 8 feet. Exceptions are two “B Zones”; these are either areas located between the limits of the 100-year flood and 500-year flood or areas subject to 100-year flooding with average depths less than one foot, and include the seashore headquarters complex site and the MD 611 right-of-way approach to the Verrazano Bridge.

### 3.4.6 SURFACE AQUIFER AND FRESH GROUNDWATER SYSTEM

The seashore has a spatially complex surface aquifer and fresh groundwater system. The water table is the top of the surficial (unconfined) aquifer that generally follows the topography of the island surface and its elevation above sea level in part controls the depth of the fresh groundwater lens beneath the island (Krantz 2009). Consequently, geomorphology related to storm processes is linked to the distribution of fresh groundwater on the island, which in turn is a primary control on plant communities (Krantz 2009).

The spatial distribution and dynamics of fresh and brackish groundwater beneath the island are strongly affected by the frequency and magnitude of the input of saltwater

onto the island surface from the ocean side and high water flooding from the bayside of the island (Krantz 2009). Both the ocean and bayside of the island have highly dynamic brackish zones in the aquifer produced by surface inundation of saltwater and deeper density-driven groundwater flow (Krantz 2009).

Six primary hydrogeomorphic units have been defined on the seashore that exhibit consistent characteristics with respect to geomorphology and hydrologic characteristics (Krantz 2009):

- The island core or the central part of Assateague Island is higher elevation and is where maritime forest generally occurs. The central part of the core has the most stable, deepest fresh groundwater lens at the seashore, reaching 7 to 8 m down and is the most consistently fresh.
- Overwash zones occur on the ocean side of the island. Overwashing seawater typically flows through low areas among the dunes, often creating channels, and ponds in swales, where the saltwater infiltrates the surficial aquifer. Groundwater is brackish nearly year-round, and highly dynamic with the episodic input of full-salinity seawater.
- Tidal marshes are one of the most extensive features on the bayside of the barrier island. Groundwater is typically brackish to fully saline, although fresher groundwater recharge from the island interior may flow shallowly beneath the marsh in discrete sand beds overlain by low-permeability saltmarsh peat and mud.
- Former inlets occur throughout the seashore. At many sites, the tidal channels of the former inlet are prominent features cutting across the island and extending as deep channels into the back-barrier lagoon. Former inlets typically have predominantly saline to brackish groundwater because they are preferential pathways for both storm overwash and subsequent groundwater flow due to coarse permeable channel fill.
- Washarounds are slightly higher elevation features in otherwise low-lying former inlets or areas of extensive overwash. The center of washarounds may have a permanent, moderately deep (3-4 m) fresh groundwater lens.
- Hundreds of ponds have formed by channelized overwash flow during storms that cut below the depth of the water table. All ponds are fed by groundwater seepage

Assateague Island National Seashore
**Fundamental Resources – Barrier Island Habitats and Species**

The unique environmental conditions found on Assateague Island are reflected in the dynamic continuum of habitats stretching from ocean to bay, including beaches, dunes, grass and shrublands, freshwater wetlands, maritime forests, and saltmarshes. The diverse landscape provides habitat for a multitude of specialized plant and animal species, many of which are rare, threatened, or endangered. Abundant and diverse populations of migratory birds - such as raptors, shorebirds, waterfowl, and neo-tropical migrants – use the seashore seasonally for breeding, overwintering, and as stopover habitat while moving along the coastal route of the Atlantic Flyway.

## 3.5 Vegetation

Vegetation at the seashore consists of forest, shrublands, marshlands, grasslands and sparsely vegetated herbaceous communities. Forests and tidal marshes generally occur on the more stable western or bayside of the island. A mosaic of fresh and brackish marshes, shrublands, and grasslands characterize the central portion of the island while grasslands associated with sand dunes dominate the more dynamic eastern margin. (See section 3.4.3 for additional discussion of marshlands.)

Environmental conditions, including elevation, the height of the groundwater table, susceptibility to overwash, and vulnerability to wind and salt spray help in determining where different vegetative communities exist at the seashore. Soil types which range from sand to loam and mucky peat are also a determinant of vegetative community as well as a result of the plants that have grown here. Vegetative communities at the seashore are described briefly below, and location, dominant species and rarity ranking are shown in table 3.2.

Plants living on the beach and foredunes must be able to withstand harsh conditions, including blowing winds, shifting sand, salt spray and soil composed of low nutrient and low moisture sand. According to The Nature Conservancy (TNC 1995) classification, this beach community is sparsely vegetated and occurs on unconsolidated sands of the beach and foredunes out of reach of regular tides, although it is frequently inundated during spring or storm tides.

Moving west, vegetation changes to a dune grass ecosystem dominated by American beach grass (*Ammophila breviligulata*), a species that is able to live and propagate despite shifting sands and which grows additional rhizomes and stems when buried by sand, and is the plant species primarily responsible for dune growth and stabilization.

**Table 3.2 Habitats and Vegetative Communities**

| Habitat | Vegetative community | Dominant Plant Species | Rank |
|---|---|---|---|
| beach and intertidal | beach | sea rocket (*Cakile edentula spp. edentula*), saltwork (*Salsola caroliniana*) | G4, G5 |
| dunes and grassland | dune grass | American beach grass (*Ammophila breviligulata*) | G3, G4 |
| | maritime dry grassland | saltmeadow cordgrass (*Spartina patens*), three square (*Scirpus pengens*) | G2, G3 |
| | Hudsonia dune | beach heath (*Hudsonia tomentosa*) and beachgrass (*Panicum amarum*), loblolly pine (*Pinus taeda*) | G2, G3 |
| forest and shrubland | maritime forest | wax myrtle (*Myrica cerifera*), black cherry (*Prunus serotina*), greenbrier (*Smilax rotundifollio*) | G2, G3 |
| | maritime shrubland | wax myrtle (*Myrica cerifera*) and bayberry (*Myrica spp)*, buttonwood (*Diodia teres*) | G2, G3 |
| | estuarine fringe | loblolly pine (*Pinus taeda*), wax myrtle (*Myrica cerifera*), vines, *Phragmites australis* in wet areas of fringe | |
| saltmarsh | high saltmarsh | saltmeadow cordgrass (*Spartina patens*), spikegrass (*Districhlis spicata*) | |
| | low saltmarsh | saltwater cordgrass (*Spartina alterniflora*), brown alga (*Ascophyllus nodosum*) | G5 |

**Key to Ranks**
G2 – imperiled G3 – vulnerable G4 – apparently secure G5 – secure

*Source: TNC 1995*

At the seashore the dune grass community also grows in meadows behind the foredune and is able to tolerate wind, salt spray, and occasional storm tidal surges. About half (40 to 60%) of the sand substrate in dune grass communities is devoid of vegetation and is open unstable sand.

Another grassland community that can grow close to the ocean at the seashore is maritime dry grassland, an open short grassland common in overwash areas. Maritime dry grassland also occupies space behind foredunes that are "blown out" during storm events.

Maritime shrubland, a patchy community of low-growing plants dominated by wax myrtle (*Myrica cerifera*), bayberry (*Myrica spp*), and buttonweed (*Diodia teres*) also grows on the unstable sands of foredunes beyond the reach of tides. Generally intolerant of salt, overwash or storm surges kill species in this community. It occurs throughout the seashore wherever afforded protection from salt water intrusion.

Behind the linear foredune or primary dune are secondary dunes, which are larger, more well-established, and varied in size and shape. Here the Hudsonia dune community occupies upland dunes. The Hudsonia dune community is locally abundant, generally occurring in the backdunes toward the west side of the seashore.

In the swales of the low lying interdunes, groundwater fluctuates and flooding can occur during rainstorms either directly or from overflow by the coastal bays. Several different vegetative communities identified by The Nature Conservancy (TNC 1995) occur here, including the maritime shrub, freshwater marsh, and shrub bog communities. The water table is shallow and several wetland herbaceous species grow here as well, creating mucky deep and wet soils over time. Freshwater plant communities such as marshes can form early in the spring growing season in standing water in dune swales, and last until the end of spring when water dries up. As freshwater marshes, shrub bog communities grow in seasonally flooded swales of dunes.

Maritime forest, which is also called the sunken forest, grows in lower elevation areas (not wet areas) of dune systems or behind them. The dunes shield this community from strong wind and salt spray allowing the growth of shrubs and vines. Dense vines grow on the crest of dunes or over older stems of shrubs in the central portion of the seashore in this community.

Another important vegetative community is the seagrass meadow which provides nursery and adult habitat for a number of aquatic species including waterbirds, fish and shellfish. The dominant seagrass in these coastal bays is eelgrass (*Zostera marina*) (NPS 2011d). (See section 3.4.2 for additional discussion of seagrass in the coastal bays.)

### 3.5.1 PLANT SPECIES OF SPECIAL CONCERN

At the seashore the NPS management actions protect several rare, threatened, or endangered plants of concern to the state of Maryland that are not subject to the Endangered Species Act or its thresholds (table 3.3). Several of these state species of

concern occur in habitat similar to that required by seabeach amaranth (*Amaranthus pumilus*). Therefore if seabeach amaranth (*Amaranthus pumilus*) and its habitat are successfully managed the state listed species will similarly benefit. Most state listed plants species at the seashore are not targeted by specific management actions except for seabeach amaranth (*Amaranthus pumilus*). However the NPS does perform periodic presence and absence monitoring (NPS undated).

## 3.6 Wildlife

### 3.6.1 MARINE WILDLIFE

Assateague Island National Seashore
**Fundamental Resources – Aquatic Habitat and Species**

From open ocean to protected estuary, the seashore includes a diverse array of aquatic habitats including abundant sea grass beds, expansive saltmarshes, and a mosaic of sandy shallows and intertidal flats. These protected habitats support a rich marine life, ranging from small sedentary plants and invertebrates to large ocean-going marine mammals.

Information on the seashore's marine resources is taken from two regional sources (US DOI BOEMRE 2006; US DOI BOEMRE 2012) and some very early data from benthic surveys off the seashore. Most of the information is not site specific, but rather applies to the offshore region of the Mid-Atlantic Bight (MAB), including the continental shelf off Maryland and Virginia (the MAB includes the Georges Bank north of Cape Code to Cape Hatteras off North Carolina and east to the Gulf Stream) (US DOI BOEMRE 2012). The biological resources that occur here are unique largely because of the meeting of relatively warm weather and cool weather regimes. This region of the inner shelf is inhabited by a large variety of species with varying temporal and spatial patterns. Nowhere else in the Atlantic does such a wide variety of cold-temperature, warm-temperature, and estuarine species co-exist. Seasonal changes in water temperature are primarily responsible for species composition and distribution, but sediment type, water depth, and hydrodynamics are also important (US DOI BOEMRE 2006).

Plankton are small, floating or weakly swimming photosynthetic organisms, classified as either algae or cyanobacteria. Plankton are an important food source in marine and estuarine ecosystems. Nutrients supplied from coastal runoff and vertical mixing in the water column support a relatively high abundance of phytoplankton out to about 20 m (65 ft) depth in the ocean (USACE 1997). Peaks in phytoplankton populations vary annually, with peak abundances occurring in spring and from late summer to late fall. Zooplankton includes those species that spend their entire lives as plankton as well as the eggs and larvae of many fish and invertebrates. Phytoplankton and zooplankton are abundant off the coast of Assateague Island (US DOI BOEMRE 2006); for example, phytoplankton has been estimated to have the highest productivity along the east coast (Sherman et al 1996 as cited in US DOI BOEMRE 2006).

Marine benthic (bottom dwelling) resources in federal waters offshore of the seashore are composed of moderate densities of arthropods (such as crabs), annelid worms, mollusks (such as clams and mussels), and echinoderms (such as starfish) (Wigley et al 1981 as cited in US DOI BOEMRE 2006). Many of the benthic organisms located off the seashore have wide-ranging distributions within the entire MAB region. Common coastal macro invertebrates include lobed moon snail (*Polinices duplicates)*, whelks *Buccinidae*), starfish (*Asteroidea*), surfclams (*Spisula solidissima*), and horseshoe crabs

**Table 3.3 Plant Species of Special Concern (Maryland)**

| Scientific Name | Common Name | Rank |
|---|---|---|
| *Amaranthus pumilus* | seabeach amaranth | SH |
| *Ammannia latifolia* | Koehne's toothcup | S2 |
| *Aristida tuberculosa* | Nuttall seabeach three-awn grass | S1 |
| *Borrichia frutescens* | DC sea ox-eye | SH |
| *Carex silicea* | Olney seabeach sedge | S1 |
| *Centella erecta* | Fern coinleaf | S3 |
| *Eleocharis albida* | Torrey white spike-rush | S1 |
| *Eleocharis rostellata* | Torrey beaked spike-rush | S3/S4 |
| *Fimbristylis caroliniana* | Carolina fimbry | S1 |
| *Fuirena pumila* | Torrey smooth fuirena | S1 |
| *Galium hispidulum* | coast bedstraw | S1 |
| *Gymnopogon brevifolius* | broad-leaved beardgrass | S1/SU |
| *Honkenya peploides* | seabeach sandwort | S1 |
| *Leptochloa fascicularis* | Gray long-awned diplachne | SU |
| *Persea palustris* | red bay | S2 |
| *Polygonum glaucum* | seaside knotweed | S1 |
| *Prunus maritima* | beach plum | S1 |
| *Sacciolepis striata* | American cupscale | S1 |
| *Scleria verticillata* | whorled nut-rush | S1 |
| *Sesuvium maritimum* | sea-purslane | S1 |
| *Spiranthes praecox* | grass-leaved lady's-tresses | S1 |

**Key to Ranks**

**S1 –** extremely rare; usually 5 or fewer populations or occurrences in the state; or may be a few remaining individuals; often especially vulnerable to extirpation

**S2 –** very rare; usually between 6 and 20 populations or occurrences; or with many individuals in fewer occurrences; often susceptible to becoming extirpated

**S3 –** rare to uncommon; usually between 20 and 100 populations or occurrences; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances

**S4 –** common; usually >100 populations or occurrences, but may be fewer with many large populations; may be restricted to only a portion of the state; usually not susceptible to immediate threats

**SH –** historically known from the state, but not verified for an extended period, usually > 15 years; this rank is used primarily when inventory has been attempted recently

**SU –** status uncertain, often because of low search effort or cryptic nature of the element

(*Limulus polyphemus*) (USACE 1997). Recent work by Cutter and Diaz (2000 as cited in US DOI BOEMRE 2006) in the MAB reported over 160 taxa of benthic organisms from 72 samples. The most abundant species were annelid worms, followed by mollusks and crustaceans. Species densities ranged from 90 to 70,000 organisms/m² and biomass varied from 0.03 to 2,000 g wet/m². These results are similar to those reported by Scott and Burton (2005) who surveyed several sites closer to shore than those reported by Cutter and Diaz (2000) (both as cited in US DOI BOEMRE 2006). Very recent and preliminary data from benthic surveys in NPS managed waters (MDGS 2012) found bottom sediments were dominated by very fine to fine sand, with areas of coarse sand and gravel and linear fields of mud and poorly sorted sand in the inner troughs between shore-attached shoals. Video from this survey found a large and vibrant community of tube worms on the bottom area fringing the mud.

Nektonic resources (stronger swimmers) in the ocean off Assateague are composed of fish, sea turtles, marine mammals, and large mobile invertebrates (squid). Most of the fish and squid, and all the sea turtles and marine mammals are seasonal migrants through the area (Musick et al 1986 as cited in US DOI BOEMRE 2006). Resident species include few fish; several macrobenthic invertebrates are common throughout the year. Over 300 species of fish are known in the MAB and many of them occur off the seashore on a seasonal basis (Sherman et al 1996 as cited in US DOI BOEMRE 2006). Several recent inshore studies (Slacum et al 2005 and Scott et al 2005 as cited in US DOI BOEMRE 2006) list over 60 fish, 16 invertebrates, and several squid species in the area. The highest diversity occurred during the summer and the lowest diversity occurred during the winter (Scott et al 2005 as cited in US DOI BOEMRE 2006).

### 3.6.2 COASTAL BAY AND TERRESTRIAL INVERTEBRATES

The estuarine environment formed by Assateague Island is home to a diverse array of invertebrates, including mollusks, crustaceans, annelid worms, arthropods, sponges, corals, bryozoans, nematodes, and tunicates. A benthic invertebrate survey in the 1990s (Prezant et al 2002 as cited in NPS 2008a) found 298 species. Freshwater invertebrates also inhabit the streams flowing into the coastal bays east of the seashore, with dominant taxa including clams, isopods, midges, and blackflies (Boward et al 2004). A 1997 to 2001 sampling effort for these streams found 70 genera of benthic macroinvertebrates. For streams and ditches supplying freshwater to Chincoteague Bay, the benthic biotic index indicated fair conditions in two streams (Paradise Branch and Riley Creek). These streams accounted for 8 percent of those sampled for Chincoteague. All others were rated poor (21%) or very poor (71%). Authors Boward and Schenk concluded the impacts to these freshwater benthic invertebrates were likely from physical changes made to streams to create ditches, as ditches have less habitat diversity and lower flows that minimally altered streams.

Another population of freshwater invertebrates exists in the permanent and seasonal freshwater pools and ponds at the seashore. This group includes dragonflies and damselflies. Although they traditionally occupy freshwater wet habitats, they were also

found in a variety of upland habitats near water and in or near the beach and saltmarsh. A survey conducted between 2005 and 2007 found 27 species of dragonflies and damselflies at the seashore; nearly all were tied to fresh or slightly brackish water (Orr 2008). The highest density was found in deeper freshwater ponds that occurred at the transition between grasslands and forest or brush edges. Although woodlands do have stable deep ponds, they are heavily shaded and accumulate pine needles which change water quality and restrict insect diversity. Abundance was also tied to rainfall, as well as the amount of light reaching the pond. Where water and sunlight were both abundant, the number of individuals was highest. Only one species of dragonfly, the seaside dragonlet, has adapted to breed in the saltmarsh.

Overall, Orr found the dynamic nature of freshwater ponds at the seashore was critical in supporting or inhibiting populations of arthropods. The most stable habitat was the saltmarsh, with dune and grassland ponds less stable. Overwash from strong storm events can either greatly reduce or even remove arthropod populations associated with more ephemeral freshwater ponds. When this occurs the resulting vacuum is filled by long-distance fliers such as dragonflies. The reintroduction of less mobile species can take months or even years and occurs primarily from foot or car traffic.

The survey of saltmarshes found that although only a relatively limited number of species of arthropods live at the seashore, densities of those species could be quite high, especially in June and July. Most appeared to be feeding on algae mats and decaying vegetation. Water boatmen, which are predatory insects, occurred in open pannes in the saltmarsh with densities on the order of 25,000 per square meter. Other species such as katydids, saltmarsh ground crickets, plant hoppers, ladybugs, wolf spiders, and marsh and fiddler crabs were found in the lower and/or upper saltmarsh habitats (Orr 2008).

Orr (2006 as cited in NPS 2008a) also surveyed the upland habitats of the seashore. Species of grasshoppers, katydids, and crickets were found in a variety of habitats, including grasslands, woodlands, brush, and open sandy areas. Leaf beetles have also been found in abundance associated with a variety of plant hosts, including grasses, woody shrubs, hardwood trees, and vines. Forty-four species of orthoptera (grasshoppers, crickets), and 50 species of leaf beetles were recorded in Orr's study. Thirty-nine species of butterflies and skippers were found in many of the island's habitats. The seashore is also host to 58 species of bees, as well as a number of moths and wasps. Of note, wild honey bees, which used to be abundant at the seashore and mainland, have been declining since the 1980s due to the introduction of tracheal and virola mites in North America; only a single individual was noted in Orr's survey.

Orr classified the groups of insects and other arthropods (crabs, spiders, etc.) into three categories – long-term resident species, mainland species, and vagrants. The long-term resident species are barrier island specialists that are able to inhabit the dynamic island habitats including the beaches and saltmarsh. Mainland species find temporary suitable habitat at the seashore to maintain their populations for a few years or a few decades,

but generally do not persist beyond that time. Vagrants tend to be migrants from the north or south or from the mainland that do not establish a viable population at the seashore. Most of the arthropod species at the seashore are mainland species. Although these species are able to exist at the seashore in the absence of severe weather or overwash conditions they are unlikely to survive larger, 100-year storms, while barrier island arthropod specialists will likely survive intact (Orr 2008).

Aquatic invertebrates in the coastal bays east of the seashore include commercially important shellfish populations, such as mussels, oysters, and clams. Mollusks are an important group of animals in an estuarine ecosystem. They help in cycling organic matter from the water column to the bottom, can have a pronounced impact on the structure of an ecosystem (by reworking the sediment, grazing, securing existing substrate, building new substrate such as oyster reefs, etc.), and are both directly harvestable and serve as an important food source for crabs, fish, and waterfowl.

Between 1993 and 1996 the MD DNR collected 50,000 individuals composed of 63 mollusk species in its coastal bays (Tarnowski 2004). Generally, the survey found that the community of mollusks differed widely with geography and was influenced by the type of sediment, interaction with other biological communities including availability and type of structures, and natural events. Mollusks also showed variability with season and year. As noted above, streams and ditches entering the bays are of lower habitat quality for the most part; this study also found species abundance was lower in these tributaries than in the open bays.

Hard clams flourished after the Ocean City Inlet opened in 1933. Prior to the inlet, salinity in the upper Chincoteague Bay was too low to support this species. The highest densities of hard clams in the area occur in Sinepuxent and Chincoteague Bays, with the highest concentration of these occurring on the east side of the bay adjacent to the seashore. Although recruitment of juveniles to the population appears to be low, the population level in Chincoteague was relatively stable from 1993 to 2003. Hard clam harvest is mostly from hydraulic escalator dredge, however seashore commercial hard clam harvest may be limited by recruitment and management constraints since 2001 (Tarnowski 2002).

The Eastern oyster has been cultured in the bay since before the Civil War. Oysters help to build reefs in an otherwise soft-bottom environment. Reefs provide protection larvae and juveniles for oysters and other aquatic species. The opening of the Ocean City Inlet and subsequent increases in predators, competition, and disease are considered the primary reasons oysters are relatively rare in Chincoteague Bay (Tarnowski 2004).

Developed during the 1850s to meet increasing demands, commercial aquaculture is still important in the Virginia portion of Chincoteague Bay (Chambers and Sullivan 2012). Commercial aquaculture initially consisted of oysters but now includes both oysters and hard clams. Currently, there are approximately 41 lease holders with about 1,233 acres leased within seashore waters. The largest single lease holder encompasses

380 acres. At this time, there are no aquaculture leases located in the Maryland portion of seashore waters, and Maryland has passed a regulation that prohibits such leases in seashore waters. However, a new five-acre lease area has recently been proposed immediately adjacent but outside of the seashore boundary in Chincoteague Bay just south of the Pirate Islands.

Bay scallops are not harvested commercially anywhere in the Coastal Bays. Scallops were caught in about 4 percent of the hard clam survey stations in the MD DNR study (Tarnowski 2004), primarily in northern Chincoteague and Sinepuxent Bay. Although the increased salinity related to the opening of the Ocean City Inlet benefitted scallops, an eelgrass wasting disease that occurred at the same time removed most of its habitat. MD DNR planted over one million bay scallops in 1997 and 1998, and in 2002 for the first time live scallops were recorded north of the Ocean City Inlet. Wild scallops of unknown origin have also recently appeared in Chincoteague Bay in the vicinity of the Maryland/Virginia state line (NPS 2008a). Despite the reintroduction and generally improving habitat conditions, scallop populations remain very low.

Crabs, and in particular the blue crab – the most commercially valuable species harvested in coastal bays – and the horseshoe crab, are monitored in the bays. The abundance of blue crabs taken from the Maryland coastal bays fluctuates; on average, between 0.5 and 1.5 million pounds of blue crab were commercially harvested from the bays between 1990 and 2002. Crab pots accounted for 98 percent of the harvest from Maryland Bays 1991-2001 (Maryland DNR. 2001). An examination of crabs caught during this period indicates no decline in average size, possibly suggesting a minimal increase in fishing pressure during this period. A substantial number of larval blue crabs are thought to remain in Chincoteague Bay, as circulation in the bay is relatively slow and larvae are not moved out to sea as they are in the Chesapeake Bay. Mature female crabs overwinter in the deepest parts of the bays. Since 1992 Hematodinium sp., a parasitic dinoflagellate, has caused substantial late season mortality in the coastal bays' blue crab population. Invasive crabs such as the green and Pacific shore crab may also threaten blue crabs.

The horseshoe crab (*Limulus polyphemus*) is an endemic species found on the east coast of the United States, with the center of abundance between New Jersey and Virginia. It is characterized by high fecundity, and can spawn multiple times per season or even per tide in the spring during new and full moon periods starting the end of April and lasting into June, laying 3500 to 4000 eggs in a cluster. Sandy beaches and nearshore shallow water mud and sand flats are important spawning and nursery habitats for the horseshoe crab. The horseshoe crab is considered a key part of the maritime food web; spawning coincides with the spring migration of shorebirds whose success or failure is dependent upon finding sufficient energy (food) to complete migration and then to breed. Horseshoe crab eggs that wash up on beach after a spawning cycle are known to supply some or the entire energy requirement to complete migration (US FWS 2014). Rufa red knot (*Calidris canutus rufa*), a bird species proposed to be listed as threatened under the Endangered Species Act, uses Chincoteague NWR beaches during spring and

fall migration, with peak spring numbers occurring in the last half of May and peak fall numbers occurring in August (Smith et al 2008); the severe decrease in horseshoe crab eggs in Delaware Bay is a suspected cause in the 68 to 80 percent decline of the species since the 1980s (Cohen et al 2009). Horseshoe crabs are not harvested for human consumption, but are important in the biomedical industry and as bait to catch American eel and whelk. In the first part of the 20th century, horseshoe crabs were used for fertilizer and animal feed (Doctor et al 2004). Regionally the horseshoe crab is probably most affected by the lingering effects of overharvesting during the 1990s and habitat lost from coastal development (Botton et al 1994 as cited in Doctor et al 2004). Horseshoe crabs are arachnids (not crustaceans), managed by the NPS as wildlife that is fished.

Commercial horseshoe crab harvest is regulated by the states of Virginia and Maryland with annual catch quotas, permits, and closures and guided by an interstate fishery management plan (ASMFC 1998, Maryland DNR 2014, Virginia MRC 2015). Maryland prohibits harvest of female horseshoe crabs, male horseshoe crabs during winter and spring, and horseshoe crabs within one mile of shore from June to mid-July (MD DNR 2014). Virginia prohibits the harvest, except biomedical catch-and-release harvest, within 1000 feet of mean low water from May 1 through June 7 (Virginia MRC 2015).

Currently, horseshoe crabs are commercially harvested for use as American eel, conch (or whelk), baitfish, and catfish bait as well as for the biomedical industry (Doctor and Wazniak 2004, ASMFC 1998). The horseshoe crab harvest is unique in that crabs can be easily harvested during their spawning season and caught with minimal financial expense. The commercial horseshoe crab fishery within the seashore has focused on the beaches and coastal waters at the southern end of the island in the vicinity of Toms Cove in Virginia. The protected bayside beaches provide suitable spawning habitat for horseshoe crabs and attract large numbers of horseshoe crabs to both the island and surrounding waters during the spawning season.

Horseshoe crabs are arachnids (arthropods), not crustaceans; therefore, they are wildlife and their harvest is prohibited in national parks (36 CFR 2.2). The seashore, now 50 years old, has never enforced this provision, which came into being after the designation of the seashore.

### 3.6.3 FISH

- **Finfishing**

Commercial fishing activity and harvest are known to occur within the seashore; however, the specific locations of commercial fishing activities and amounts of harvests within the seashore boundary, as well as gears used, are not currently documented.

Many of the region's valuable commercial finfish are dependent on estuaries for food or nursery habitat. These include summer flounder (*Paralichthys dentatus*), bluefish (*Girella cyanea*), weak fish (*Cynoscion regalis*), spot (*Leiostomus xanthurus*), Atlantic

croaker (*Micropogonias undulates*), American eel (*Anguilla rostrata*), and striped bass (*Morone saxatilis*), as well as smaller forage species such as Atlantic menhaden (*Brevoortia tyrannus*), Atlantic silverside (*Menidia menidia*), and bay anchovy (*Anchoa mitchili*). Finfish harvesters utilize trawl and gill nets and eel pots (Forsell 1999; Virginia MRC. 2014; Maryland DNR 2014). In 2002 commercial landings for these and all species of finfish at Ocean City totaled 12 million pounds worth $8 million; most of this catch was taken from the Atlantic rather than the coastal bays. Trend data indicate a slow downward movement since the mid-1980s. This is primarily a result of the decreased abundance of forage species, including bay anchovy (*Anchoa mitchili*), Atlantic menhaden (*Brevoortia tyrannus*), spot (*Leiostomus xanthurus*), and Atlantic silverside (*Menidia menidia*) (Casey et al 2004).

In addition to commercial catch, recreational fishing and low oxygen events affect finfish populations. Sportfishing in both the bays and in the ocean is an important economic contributor in Maryland. In 2003, over 700,000 people fished seven million days in Maryland waters (Casey et al 2004). Kills from low oxygen have been a particular problem for the smaller forage species noted above, as these are the most susceptible species to low oxygen levels (NPCA 2007). Since 1984, 49 confirmed or probable fish kill events resulted in approximately 3.3 million mortalities; most of these events occurred in dead end canals along developed shorelines outside the seashore's boundaries. The majority of these events occurred in summer months when decaying algal blooms and higher temperatures lower available oxygen. The average number of fish kill events reported in the 1980s and 1990s was 1.5 per year. This increased to seven per year from 2000 to 2004 (Luckett et al 2004).

Summer flounder (*Paralichthys dentatus*) have recently recovered from overfishing and a population collapse in 1989 and are rising in abundance in the waters off Assateague Island (Casey et al 2004). While flounder numbers are recovering they are still below what is considered optimum (NPCA 2007). Declining populations of forage fish eaten by flounder may be partially at fault.

- **Saltmarsh Fish**

As part of its long term monitoring program in 2008 the NPS collected fish and other nektonic species from select marsh pools, tidal creeks, and bay shoreline habitats less than one meter deep (NPS 2011d). Seventeen species were collected, including 15 species of nekton, one species of crab, and one species of shrimp. Four species of fish account for 94 percent of fish collected – sheepshead minnow (*Cyprinodon variegatus*), common mummichog (*Fundulus heteroclitus*), rainwater killifish (*Lucania parva*), and inland silverside (*Menidia beryllina*). Of these, the sheepshead minnow (*Cyprinodon variegatus*) accounted for the great majority.

- **Essential Fish Habitat**

The 1996 Magnuson-Stevens Act required agencies and others to cooperate to protect, conserve, and enhance essential habitats for federally managed marine and anadromous fish species. Essential fish habitats are those water and substrate areas needed for fish to spawn, breed, feed, and grow to maturity. Species for which essential fish habitat exists either offshore of the seashore or in Chincoteague Bay include red hake (*Urophycis chusss*), winter flounder (*Pseudopleuronectes americanus*), window pane flounder (*Scophthalmus aquosus*), bluefish (*Girella cyanea*), king and Spanish mackerel (*Scomberomorus cavalla*), cobia (*Rachycentron canadum*), summer flounder (*Paralichthys dentatus*), scup (*Stenotomus chrysops*), black sea bass (*Centropristis striata)*, spiny dogfish (*Squalus acanthias*), and several species of sharks that migrate through the area (such as sand tiger shark (*Carcharias taurus*), blue shark (*Prionace glauca*), sandbar shark (*Carcharhinus milberti*), and scalloped hammerhead shark (*Sphyrna lewini*)) (NOAA 2012a). Adults of most of these species also use marine or brackish waters in essential fish habitat either in Chincoteague Bay or the Atlantic coast and several require estuaries or other specific habitat for laying eggs, larvae, and juveniles. Those species that require a sandy substrate for stages of their lifecycle where essential fish habitat exists off the coast of the seashore (black sea bass (*Centropristis striata*), possibly adult spawning winter flounder (*Pseudopleuronectes americanus*) are susceptible to effects when sand nourishment occurs to protect beaches.

### 3.6.4 AMPHIBIANS AND REPTILES

The seashore and surrounding waters provide habitat for 19 species of reptiles and 7 species of amphibians (Mitchell 1994 and Brotherton 2005 as cited in NPS 2008a). Several of these species are found only on the Virginia side of Assateague Island where artificially created water impoundments have increased habitat diversity for those that are water dependent.

Eleven species of turtles have been documented at the seashore. Four of these are marine, one is an upland species, and the remaining are dependent on the saltmarsh, bay, or freshwater habitats. These latter species include eastern mud turtle (*Kinosternon subrubrum subrubrum*), snapping turtle (*Chelydra serpentina serpentine*), spotted turtle (*Clemmys guttata*), eastern painted turtle (*Chrysemys picta picta*), and northern red-bellied cooter (*Pseudemys rubriventris*). The northern diamondback terrapin (*Malaclemys terrapin*) is an estuarine-dependent species and is fairly abundant at the seashore although there may be considerable mortality associated with by-catch from commercial crabbing.

Five species of sea turtles occur in the MAB area, of which the loggerhead (*Caretta caretta*) and Kemp's Ridley (*Lepidochelys kempii*) are the most abundant. The Atlantic leatherback (*Dermochelys coriacea*), green (*Chelonia mydas*), and hawksbill (*Eretmochelys imbricata*) turtles also occur, but are far less abundant. Most of these

turtles overwinter south of Cape Hatteras and migrate into or through the area in early spring or summer. Four of these species have been documented in waters offshore of Assateague (hawksbill turtles (*Eretmochelys imbricata*) have not been sighted). All of these species are federally listed as threatened or endangered and are discussed in section 3.7. Atlantic Loggerhead turtles (*Caretta caretta*) occasionally nest at the seashore (primarily at the southern end), and single event nests of leatherback (*Dermochelys coriacea*) and green sea turtles (*Chelonia mydas*) have been documented. Most observations are from strandings, 90 percent of which involve loggerheads (*Caretta caretta*) (NPS 2008a).

The seashore is also host to six species of frogs and toads, which is low compared to the 23 amphibian species on the neighboring mainland. The most abundant amphibian at the seashore is the Fowler's toad (*Anaxyrus fowleri*) which is dependent – as other amphibians – on the seashore's ponds and wetlands for reproduction.

Seven species of snakes occur at the seashore. All are non-venomous (NSP 2008a). One species, the northern water snake (*Nerodia sipedon sipedon*), is primarily aquatic and closely tied to saltmarshes or ponds. Others are found in a variety of upland habitats including shrub, beaches, grasslands, forests, and open areas.

Only one lizard species has been documented at the seashore, the northern fence lizard (*Sceloporus undulatus hyacinthinus*).

Of the species of reptiles and amphibians recently observed within the Maryland portion of the seashore, eleven are considered stable and five have experienced decline. Several of the declining species were already uncommon or rare. Brotherton attributes their decline to intolerance to the harsh and dynamic barrier island environment and the seashore's relative isolation from source populations (Brotherton 2005 as cited in NPS 2008a).

### 3.6.5 BIRDS

The seashore affords important habitat for a variety of birds. It lies on the Atlantic Flyway and provides one of the longest stretches of undeveloped and high quality habitat between Forsythe National Wildlife Refuge in New Jersey and Pea Island National Wildlife Refuge in North Carolina. The seashore offers nesting habitat for both resident and seasonal species, stopover habitat for long distance migrants, and wintering habitat for northern species. Intertidal sand and mud flats at the seashore are prime feeding areas for shorebirds because of horseshoe crab eggs and other high quality invertebrate and small fish food sources (US FWS 1993). The waters surrounding the island support large numbers of wintering waterfowl and seabirds. Bird species occurring in significant numbers at the seashore (in Maryland) include the largest ground-nesting colony of least tern (*Sterna antillarum*) in Maryland, black skimmers (*Rynchops niger*) (state endangered), and peregrine falcons (*Falco peregrinus*). Migrant shorebirds congregate along the ocean beach in numbers significant at the state level, the most abundant species being sanderling (*Calidris alba*), dunlin (*Calidris alpina*), and

ruddy turnstone (*Arenaria interpres*). The saltmarshes support significant populations of two Audubon watchlist species – saltmarsh sharp-tailed sparrow (*Ammodramus caudacutus*) and seaside sparrow (*Ammodramus maritimus*). Because of this high diversity and relative abundance, and because the seashore is also home to 60+ pairs of the federally threatened piping plover (*Charadrius melodus*) that nest on its beaches (representing 2% of this species' global population), it is designated by the National Audubon Society as a globally important bird area and is a component of the Western Hemisphere Shorebird Reserve Network (table 1.4).

The exact number of species at the seashore varies from year to year, but is well over 300 and has recently been reported as "at least 338", including species of migratory, wintering, resident, or nesting birds (Hoffman, MD DNR as cited in NPS 2008a). Observed species include shorebirds, waterfowl, upland songbird species, and raptors.

Upland birds in shrub and forest habitat include owls, woodpeckers, flycatchers, sparrows, and warblers. Some of the most common nesting passerines (small to medium perching songbirds) include the red-winged blackbird (*Agelaius phoeniceus*), song sparrow (*Melospiza melodia*), yellow-throated warbler (*Dendroica dominica*), fish crow (*Corvus ossifragus*), gray catbird (*Dumetella carolinensis*), pine warbler (*Dendroica pinus*), and Carolina wren (*Thryothorus ludovicianus*).

Raptors including red-tailed hawks (*Buteo jamaicensis*), ospreys, kestrels, merlins, sharp-shinned hawks (*Accipiter striatus*), and the state protected bald eagle (*Haliaeetus leucocephalus*) and northern harrier (*Circus cyaneus*) migrate along the Atlantic Flyway and pause to rest at the seashore during the fall. Peregrine falcons (*Falco peregrinus*), which are not listed but are relatively rare, also use the island to rest during their fall migration from the arctic to the southern hemisphere (Seeger et al 2010). More than 400 peregrines are counted at the seashore during most fall seasons. In 2010 457 peregrine sightings were reported (National Audubon Society 2012). Most of these were tundra peregrines (*Falco peregrines tundrius*), a migratory arctic nesting sub species. Although the population declined from DDT use in the mid-1940s, it rebounded dramatically after the ban of DDT in 1972. Today peregrine falcons (*Falco peregrinus*) have been removed from the federal list of endangered species

Some of the most important habitats for breeding birds at the seashore include the sparsely vegetated upper beaches and overwash flats created and maintained by storm events. These habitats are unique to barrier islands and are used by a variety of rare ground-nesting shorebirds and colonial water birds. Seagrass beds in Chincoteague and Sinepuxent Bay are important foraging habitat for waterfowl including American black duck (*Anas rubripes*), Northern pintail (*Anas acuta*), American wigeon (*Anas americana*), ruddy duck (*Oxyura jamaicensis*), and canvasback (*Aythya valisineria*). Coastal marshes are important for wading birds such as blue herons (*Ardea herodias*) and snowy egrets (*Egretta thula*), and provide nesting habitat for clapper rail (*Rallus longirostris*), black rail (*Laterallus jamaicensis*), least bittern (*Ixobrychus exilis*), Forster's tern (*Sterna forsteri*), and laughing gull (*Larus atricilla*). Beaches and tidal flats provide feeding and resting

habitat for migratory species such as red knot (*Calidris canutus*), piping plovers (*Charadrius melodus*), American oystercatcher (*Haematopus palliatus*), ruddy turnstone (*Arenaria interpres*), sanderling (*Calidris alba*), and sandpipers (*Scolopacidae sp.)* (Glick et al 2008).

Assateague is home to eight colonial nesting seabird colonies, as well as a host of rare, threatened, or endangered bird species. Federally listed species are described in section 3.7. State listed species, which are managed in units of the national park system for protection, are not subject to these thresholds and so are described in section 3.6.7.

Twenty-two species of colonial waterbirds breed in Maryland, including gulls, terns, herons, night herons, egrets, skimmers, pelicans, ibises, and cormorants. The majority of waterbird species nest on or near the ground. Most colonies in the Maryland Coastal Bays are located on either natural or dredge spoil bay islands because of the absence of mammalian predators. Within these islands, nests are located on bare sand or shell and in marsh grasses, *Phragmites austrailis*, shrubs, and small trees. Colonies may be single species or multiple species, such as mixed heronries. Nests are separated by less than one meter in most species and the largest colonies have more than 1500 nesting pairs (MD DNR 2004).

During the period 1985 to 1995, the MD DNR surveyed and reported monitoring results for 21 different colonial nesting sites within or near the seashore. Species observed nesting in these sites included egrets, herons, ibis, pelicans, terns, gulls, and black skimmers *(Rynchops niger*). In 2009, NPS staff visited each of these colonies to update results, including determining the exact location of each colony, whether each continued to be active, and which species were nesting. The NPS biologists also surveyed appropriate habitat to see if any new colonies had established since 1995. Seven of the historic sites showed evidence of nesting during the 2009 breeding season (NPS 2009). Some supported multi-species colonies, while others had as few as two nests. No evidence of breeding was found at ten of the historic sites, three were not within the seashore, and one had been lost to erosion or subsidence. The biologists also found a new and active site. Nesting was confirmed at one or more of the eight sites for Great Black-backed gull (*Larus marinus*), herring gull (*Larus argentatus*), double-crested cormorant (*Phalacrocorax auritus*), glossy ibis (*Plegadis falcinellus*), and great egret (*Casmerodius albus*). Species present but nesting unconfirmed included: black-crowned night heron (*Nycticorax nycticorax*), yellow-crowned night heron (*Nyctanassa violacea*), tricolored heron (*Egretta tricolor*), cattle egret (*Bubulcus ibis*), snowy egret (*Egretta thula*), and brown pelican *(Pelecanus occidentalis*). While great black-backed gull (*Larus marinus*) and great egret (*Casmerodius albus*) numbers have increased in recent years, herring gull (*Larus argentatus*) breeding populations and glossy (*Plegadis falcinellus*) ibis numbers have decreased in the Chesapeake Bay region (Erwin et al 2010). Of the wading birds, both black-crowned night heron (*Nycticorax nycticorax*) and yellow-crowned night heron (*Nyctanassa violacea*)numbers have increased and the rest have declined (ibid).

### 3.6.6 MAMMALS

Upward of 20 marine mammals, including pinnipeds and cetaceans, may occur in the seashore's ocean waters on a seasonal basis (Waring et al 2002 as cited in US DOI BOEMRE 2006). The offshore area is adjacent to areas on the mid-shelf, where marine mammals that prefer fish and squid are known to concentrate (Kenney et al 1986 as cited in US DOI BOEMRE 2006). During the summer bottlenose dolphins (*Tursiops truncatus*) occur in high concentrations; the harbor porpoise (*Phocoena phocoena*) dominates during the winter (Kenney et al 1986 as cited in US DOI BOEMRE 2006). During the fall dolphins migrate south following schools of migratory fish. At the peak of the migration season, a near continuous column of dolphins can be seen from the beaches of Assateague (NPS 2008a). Harbor seals (*Phoca vitulina*) are also common in winter. Several whales are transient seasonally through the area, including North Atlantic right whales (*Eubalaena glacialis*), which are common during migrations to and from calving grounds in the south Atlantic. A number of immature Great Atlantic right whales (*Eubalaena glacialis*) also winter along the local coastline and can sometimes be seen from the beach (US DOI BOEMRE 2006). Juvenile humpback whales (*Megaptera novaeangliae*) are also known to overwinter here, and short-finned pilot whales (*Globicephala macrorhynchus*) are common during summer months (US DOI BOEMRE 2006). Documented marine mammals offshore of the seashore include six species of baleen whales, 16 species of toothed whales (includes dolphins), the West India manatee (*Trichechus manatus*), and four species of seals (NPCA 2007).

Upland mammals include common muskrat (*Ondatra zibethicus*), North American river otter (*Lutra canadensis*), common opossum (*Didelphis marsupialis*), eastern cottontail (*Sylvilagus floridanus*), eastern gray squirrel (*Sciurus carolinensis*), meadow vole (*Microtus pennsylvanicus*), least shrew (*Cryptotis parva*), and several species of mice and rats. Rodents such as the meadow jumping mouse (*Zapus hudsonius*) and meadow vole (*Microtus pennsylvanicus*) live in grassy areas bordering saltmarsh and freshwater wetlands. North American river otter (*Lutra Canadensis*) and common muskrat (*Ondatra zibethicus*) use the seashore's marsh habitats and adjacent waterways.

Three species of bats – eastern red bat (*Lasiurus borealis*), big brown bat (*Eptesicus fuscus*), and Seminole bat (*Lasiurus seminolus*) – were found inside the seashore in a series of mist net surveys conducted in 2005 and 2006. Acoustical monitoring indicated three additional species – silver haired bat (*Lasionycteris noctivagans*), hoary bat (*Lasiurus cinereus*), and eastern pipistrelle (*Pipistrellus subflavus*). Most of those captured in nets were eastern red bats (*Lasiurus borealis*). Activity was highest in forests and near freshwater pools. The low diversity of bat species was attributed to the relatively low diversity of forest roosting habitat at the seashore. However, many of the captured eastern red bats (*Lasiurus borealis*) were reproductive females and juveniles, indicating that the island has maternity roosts.

Meso-predators include red fox (*Vulpes vulpes*), common opossum (*Didelphis marsupialis*), and raccoon (*Procyon lotor*). Foxes are one of the most influential

predators of ground-nesting birds such as tern, skimmers, and plovers. The NPS protects piping plover (*Charadrius melodus*) nests from predation, including periodically controlling the north end the fox population. Opossum (*Didelphis marsupialis*) are primarily carrion eaters. Raccoons (*Procyon lotor*) are opportunistic feeders that consume a wide range of food sources such as bird eggs and aquatic invertebrates.

Three large mammals live at the seashore: the native white-tailed deer (*Odocoileus virginianus*), non-native sika deer (*Cervus nippon*), and feral horses (*Equus caballus*). Historical documents refer to the presence of horses on Assateague Island since the late 1600s. Early residents of the region used the island to graze horses and other livestock, with periodic roundups or "pennings" held to determine ownership and to count and sell stock. Although the familiar legends of ponies escaping from a wrecked Spanish ship persist, they appear to have little basis in fact (NPS 2008a). When the seashore was established in 1965, most of the horses were confined to the Chincoteague National Wildlife Refuge (CNWR) in Virginia by a fence on the northern reaches of the refuge. The exception was a small, free-ranging herd belonging to a Maryland landowner who had purchased horses at the annual Chincoteague penning event in 1961. In 1968, the NPS acquired legal ownership of those horses and their offspring. The horses are considered a "desirable feral" species by the NPS, although they do have impacts on marsh and beach habitat and wildlife, and are genetically the product of a limited gene pool. In an effort to reduce the population size, in 1994 the NPS began a contraception program involving most of the Maryland herd's breeding age females. Since the program began the herd size has declined from 170 horses to 93 horses (in 2015). The NPS has completed an environmental assessment of herd management alternatives; the preferred alternative proposes to reduce the Maryland herd to between 80 and 100 horses in order to maintain genetic diversity and to not adversely affect island vegetation (NPS 2008a).

Sika deer (*Cervus nippon*) which are a small species of elk native to Asia, were introduced in the 1920s and have since become well-established throughout the seashore. Populations estimates of sika deer (*Cervus nippon*) in the Maryland portion of the island in 2006 were 342, about three times that of the native white-tailed deer (*Odocoileus virginianus*) (116) (NPS 2008a). Both species of deer are managed through an annual hunting program.

### 3.6.7 WILDLIFE SPECIES OF SPECIAL CONCERN

Table 3.4 shows species of concern in the state of Maryland. The first three species listed are also threatened or endangered on the federal list and are discussed in section 3.7 below.

Two species of invertebrates, the white tiger beetle (*Cicindela dorsalis media*)and the little white tiger beetle (*Cicindela lepida*), are listed as S1 (highly state endangered). The white tiger beetle (*Cicindela dorsalis media*) is rarer at the seashore and occurs only in the north end and in a small area immediately north of the state line. This species

**Table 3.4 Wildlife Species of Special Concern (Maryland)**

| Scientific Name | Common Name | State Rank | State Status |
|---|---|---|---|
| *Caretta caretta* | Loggerhead Sea Turtle | S1B, S1N | T |
| *Dermochelys coriacea* | Leatherback Sea Turtle | S1 | E |
| *Charadrius melodus* | Piping Plover | S1 | E |
| *Cicindela dorsalis media* | White tiger beetle | S1 | E |
| *Cicindela lepida* | Little white tiger beetle | S1 | E |
| *Haematopus paliatus* | American oystercatcher | S3B | None |
| *Sternula antillarum* | Least tern | S2B | T |
| *Rynchops niger* | Black skimmer | S1B | E |
| *Ixotrychus exilis* | Least bittern | S2S3B | I |
| *Haliaeetus leucocephalus* | Bald eagle | S3B | None |
| *Circus cyaneus* | Northern harrier | S2B | None |
| *Cistothorus platensis* | Sedge wren | S1B | E |
| *Gelochelidon nilotica* | Gull billed tern | S1B | E |
| *Thalasseus maximus* | Royal tern | S1B | E |
| *Charadrius wilsonia* | Wilson's plover | S1B | E |
| *Nyctanassa violacea* | Yellow crowned night heron | S2B | None |
| *Thalasseus sandvicensis* | Sandwich tern | S1B | None |
| *Podilymbus podicepts* | Pied billed grebe | S2B | None |

**Key to Codes**
S1 – highly state rare, critically imperiled in Maryland
S2 – State rare; imperiled in Maryland because of rarity
S3 – Rare to uncommon
B – Animal is migratory and rank refers only to the breeding status
N – Animal is migratory and rank refers only to non-breeding status
T – state threatened
E – state endangered
I – in need of conservation

forages along the high tide line and lays its eggs in the upper beach and primary dune. The population has ranged from 14 to 698 individuals since surveys began in 1985. It is considered secure globally. The little white tiger beetle (*Cicindela lepida*) occurs on interior dune habitats and prefers areas of dune blowouts and over wash channels. It is more widely distributed at the seashore than the white tiger beetle (*Cicindela dorsalis*

*media*); the population has ranged from 84 to 892 individuals since surveys began in 1990. However, the global population of the little white tiger beetle (*Cicindela lepida*) is G3/G4 (very rare and local throughout its range) (MD DNR 2010a). The American oystercatcher (*Haematopus palliatus*), is not a listed bird but its numbers have declined in recent years. It is on the National Audubon "watch list" and ranked as S3 (rare to uncommon) by the state. In its monitoring of other shorebirds of concern (least tern (*Sterna antillarum*) and piping plover (*Charadrius melodus*)) the NPS tracks nesting activities, including successful fledging of chicks. This species nests along both ocean and bay shorelines at the seashore. In 2010 and 2011 the NPS scanned nests along the ocean shoreline (NPS 2010b; NPS 2011c). In 2010 26 adult American oystercatchers (*Haematopus palliatus*) were counted on the north end and 11 in the OSV use area on the south end. On the north end 14 nesting pairs attempted 22 nests; of these six hatched and 10 chicks were fledged. The southern nests all failed. In 2011, 23 nesting attempts from 15 nesting pairs of American oystercatchers (*Haematopus palliatus*) occurred on the north end and two on the south end. One of the two southern nests hatched and fledged two chicks, the other failed. A total of 11 chicks were fledged from northern nests.

The 2011 report also noted that five breeding pairs of common terns (*Sterna hirundo*), a species that was severely reduced in the 19$^{th}$ and 20$^{th}$ century from hunting, were counted at km 6.0 and one chick fledged (NPS 2011c). This was the first year since 1997 that common terns successfully hatched nests at the seashore.

Least terns (*Sterna antillarum*) are a state threatened species that nests in open, sandy habitat. Due to fox disturbance they are usually more scattered than the species appears to prefer. While monitoring piping plovers (*Charadrius melodus*), NPS biologists have also surveyed least tern nesting sites. In 2010 298 nests were counted and in 2011 360 nests counted in the north end (from the inlet to km 9.5). In the late winter of both years, the NPS participated in a multi-agency removal of foxes from the north end, which appears to have contributed to nesting attempts and success by least terns (NPS 2010b; NPS 2011c).

The 2011 report on nesting piping plovers (*Charadrius melodus*) also looked for evidence of other nesting seabirds. In addition to finding least tern (*Sterna antillarum*) and common tern (*Sterna hirundo*), and American oystercatcher (*Haematopus palliatus*) NPS biologists found that black skimmer (*Rynchops niger*) (a state endangered species) were also displaying courtship behavior, although no eggs were found. This species historically nested on the beaches of the seashore but has not successfully bred in recent years, largely due to predation pressures of red fox (*Vulpes vulpes*) and disturbance by feral horses (*Equus caballus*) (NPS 2008a).

Maryland tracks bald eagles (*Haliaeetus leucocephalus*) because of the global significance of Maryland occurrences and because they are protected under the Golden and Bald Eagle Protection Act and the Migratory Bird Treaty Act. Bald eagle sightings have increased in recent years (Seegar et al 2010). Bald eagles (*Haliaeetus*

*leucocephalus*) nested at a single location at the seashore during 2001, 2002, 2006, and 2007, and 2011. There were two active nests in 2012. Up to 30 bald eagles (*Haliaeetus leucocephalus*), including many juveniles, also use the seashore during the winter months.

Northern harrier (*Circus cyaneus*) generally inhabits marshlands or wet meadows and are far more numerous across the northern Great Plains than in the east. Populations have generally declined in the northeast throughout the twentieth century, primarily as a result of habitat destruction and more intensive agricultural use of remaining grasslands (Sauer et al 2011; accessed 02.20.12).

The sedge wren (*Cistothorus platensis*) a small, brown songbird that is classified by the state as endangered, prefers marshes and wetland habitat. The species has been observed in the past at the seashore, but it is unknown whether the bird breeds there. The deteriorated condition of the seashore's saltmarsh habitats might play a role in its limited occurrence.

Gull-billed terns (*Gelochelidon nilotica*) (state endangered) and Wilson's plover (state endangered), also nest on barrier islands, but none of these state listed species have nested at the seashore in recent years. Gull-billed terns (*Gelochelidon nilotica*) last nested at the seashore in the early 1990s in a colony of royal terns (state endangered). The Wilson's plover (*Charadrius wilsonia*), a state endangered species, is an infrequent and rare breeder on open washes/sand flats, beaches, and dredge spoil mounds in Sinepuxent Bay. It has not been observed breeding in Maryland for more than 10 years (MD DNR 2004). It is also limited by human disturbance of nesting habitat.

Surveys of waterbird colonies indicate that 20 species currently inhabit in the coastal bays, including the state endangered royal tern (*Thalasseus maxima*), sandwich tern (*Thalasseus sandvicensis*), and yellow-crowned night heron (*Nyctanassa violacea*), and other species considered rare (MD DNR 2004). The only Maryland breeding colonies for royal tern (*Thalasseus maxima*), sandwich tern (*Thalasseus sandvicensis*), and gull-billed (*Gelochelidon nilotica*) tern are in the Coastal Bays.

A Virginia study of 13 wading birds found that the number of breeding pairs of yellow-crowned night heron (*Nyctanassa violacea*) increased from 55 in 1977 to 476 in 2003 (Williams et al 2007). The number of breeding colonies also increased from 10 in 1977 to 57 in 2003. This occurred despite a decline in the population across Virginia.

Pied billed grebes (*Podilymbus podiceps*) are a wetland species and the only breeding grebe in the Mid-Atlantic/New England region. It is considered a species of high conservation concern in parts of its range, but is secure globally (MD DNR 2010b). Threats include threats to the quality of its breeding habitat such as invasive plants and water pollution in the Coastal Bays. In addition, pied-billed grebes (*Podilymbus podiceps*) appear to be a carrier of West Nile virus; efforts to control mosquitoes could have adverse effects to reproductive success or health (US FWS undated).

## 3.7 Federally Listed Threatened or Endangered Species

Nine federally listed threatened or endangered plants and animals have been observed within the seashore, including sea turtles (four species), whales (three species), piping plover (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) (table 3.5).

**Table 3.5 Federally Listed Threatened or Endangered Species**

| Scientific Name | Common Name | Rank |
|---|---|---|
| *Charadrius melodus* | Piping plover | Threatened |
| *Amaranthus pumilus* | Seabeach amaranth | Threatened |
| *Caretta caretta* | Atlantic loggerhead sea turtle | Threatened |
| *Chelonia mydas* | Green sea turtle | Endangered |
| *Dermochelys coriacea* | Leatherback turtle | Endangered |
| *Leidochelys kempi* | Kemp's Ridley sea turtle | Endangered |
| *Eubalaenas glacialis* | Northern right whale | Endangered |
| *Megaptera novaeangliae* | Humpback whale | Endangered |
| *Physeter catodon* | Sperm whale | Endangered |

### 3.7.1 PIPING PLOVER (*Charadrius Melodus*)

The piping plover (*Charadrius melodus*) is a small, stocky, sandy-colored shorebird resembling a sandpiper. The Atlantic coast population was listed as threatened under the Endangered Species Act in 1986. The Atlantic coast population of piping plover (*Charadrius melodus*) breeds on coastal beaches from Newfoundland and southeastern Quebec to North Carolina. Piping plovers (*Charadrius melodus*) were common along the Atlantic Coast during much of the 19th century, but nearly disappeared due to excessive hunting for the millinery trade. Following passage of the Migratory Bird Treaty Act in 1918, numbers recovered to a 20th century peak which occurred during the 1940s. The current population decline is attributed to increased development and recreational use of beaches since the end of World War II. The most recent surveys place the Atlantic population at less than 2000 pairs.

The northern 9.5 kilometers of the seashore has supported up to 60+ pairs of breeding piping plovers (*Charadrius melodus*) and is the only nesting site for this species in Maryland. Most nesting takes place in the northern part of the seashore where overwash is more frequent and human disturbance is less common. In the southern end (within the OSV use area) further disintegration of the man-made protective dune – constructed in the 1960s – will improve habitat conditions; if plover nests are seen in this area, the 200m buffer is enforced by closing it to OSV use and predator cages are installed for protection. In 2010, 41 pairs of plovers hatched 149 chicks and 48

survived; the number of chicks fledged per pair was 1.09 (NPS 2010b). In 2011 32 successful nests hatched 107 chicks, of which 45 survived to fledging age, for a productivity of 1.25 chicks fledged per pair (NPS 2010b). The FWS recovery goal is 1.5 chicks/pair, which the seashore population has met in 7 of the 21 breeding seasons from 1986 to 2007 (NPS 2001b; NPS 2008a; NPS 2010b, NPS 2011c).

The nest survival and hatching success rate is low at the Assateague Island National Seashore compared to other areas. Weather, possible effects of the Deepwater Horizon oil spill, visitor and OSV use, predation pressure (primarily from red fox), and less than optimum habitat conditions in parts of the seashore are all considered possible reasons for this low productivity (NPS 2010b). To help improve reproductive success, the NPS has installed predator exclosure cages around individual nests since 1988 and periodically removes select predators from the plover's primary breeding grounds. Other management actions include public use closures to protect breeding birds from visitor use impacts. The population has fluctuated from a low of 14 pairs in 1990 to a high of 66 pairs in 2004 (NPS 2008a); the 2011 population was 36 breeding pairs (C. Zimmerman, pers comm. 07/2012).

Piping plovers (*Charadrius melodus*) breed in the spring, laying eggs in April in a depression in the sand somewhere on the high beach. The nest is sometimes lined with small stones or fragments of shell. The eggs hatch in about 25 days, and the young are soon able to follow their parents in foraging for marine worms, crustaceans, and insects they pluck from the sand. When predators or intruders come close, the young stay motionless on the sand while the parents attempt to attract the attention of the intruders, often by feigning a broken wing. Surviving young are fledged in about 30 days. If nesting is disrupted before the eggs hatch, the plovers will often re-nest, with chicks not fledged until late August. By mid-September, both adult and young plovers will have departed for their wintering areas.

Piping plovers (*Charadrius melodus*) are dependent on early-successional, disturbance habitats for both nesting and foraging. These types of habitats are created and maintained by washover during major storms. Both adults and chicks use the low, moist interior sand flats and bayside habitats to forage. It is important that this species have expanses of sparsely vegetated flat ground, as predators hide in more dense vegetation or block the plover's view of aerial predators, and can be a substantial reasons nests fail. When strong storms do not occur for several years (typical of the seashore since the late 1990s), vegetation grows in and plover habitat decreases. In addition to loss of foraging habitat and increased predation, the increased vegetation can attract more Assateague horses, which can inadvertently impact eggs and nests through trampling.

### 3.7.2 SEABEACH AMARANTH (*AMARANTHUS PUMILUS*)

Seabeach amaranth (*Amaranthus pumilus*) is a federally threatened species listed in 1993. It is an annual vascular plant that inhabits upper beaches and overwash areas. Without overwash to maintain the open, sparsely vegetated habitat required by seabeach amaranth (*Amaranthus pumilus*), other plants out compete and eliminate it.

Seabeach amaranth (*Amaranthus pumilus*) has been lost over much of its former range on the east coast, primarily from development and stabilization of barrier island beaches. Today the seashore hosts the only population of seabeach amaranth (*Amaranthus pumilus*) in Maryland. It was considered extirpated from the seashore until 1998, when two plants were discovered after 30 years of no observed occurrences. During the next few years, an additional five plants were discovered; some were removed to a greenhouse and used to produce seeds and plant stock for restoration. The NPS planted more than 5,000 amaranth seedlings at restoration sites from 2000 to 2002. By 2001, 800 wild amaranth were growing naturally from seeds and young plants. Research determined that the primary factors limiting amaranth success included herbivory by deer, horses, and insects, as well as weather extremes, habitat conditions, and overwash events. NPS staff found that burying from sand actually stimulated growth. In 2005, NPS managers began a larger scale program to protect amaranth from deer and horse browsing and OSV use through the use of cages, signs, and marking. By 2006 the population was up to 1,500 wild plants, and by 2007 had increased to a record 2,179.

### 3.7.3 SEA TURTLES

All species of sea turtles in waters of the United States are currently listed as threatened or endangered. The FWS and NOAA National Marine Fisheries jointly manage sea turtles. Four species of marine sea turtles have been documented either within the seashore's waters and/or on its beaches, including the Atlantic loggerhead (*Caretta caretta*), green sea turtle (*Chelonia mydas*), leatherback turtle (*Dermochelys coriacea*), and Kemp's Ridley sea turtle (*Leidochelys kempi*). By far most observations at the seashore are of loggerhead strandings, which occur when they are killed by boat collisions or commercial fishing gear, or die from natural causes. Loggerheads also occasionally nest at the seashore; single event nesting by leatherback and green sea turtles have also been documented (NPS 2008a).

- **Atlantic Loggerhead Turtle**

Loggerheads in the waters adjoining the seashore are part of the Northwest Atlantic distinct population segment, which is listed as threatened (NOAA 2012a). Loggerheads nest on ocean beaches, generally preferring high energy, relatively narrow, steeply sloped, coarse-grained beaches. Loggerheads are circumglobal, occurring throughout the temperate and tropical regions of the Atlantic, Pacific, and Indian Oceans, and are the most abundant species of sea turtle found in coastal waters of the United States. In the Atlantic Ocean the range of the loggerhead turtle range extends from

Newfoundland to as far south as Argentina. During the summer, nesting occurs primarily in the subtropics. Although the major nesting concentrations in the United States are found from North Carolina through southwest Florida, minimal nesting occurs outside of this range westward to Texas and northward to Maryland. Nesting at the seashore is a relatively unusual occurrence.

Somewhere between 7- to 12-years-old, oceanic juveniles migrate to nearshore coastal zone and continue maturing until adulthood. In addition to providing critically important habitat for juveniles, the nearshore coastal zone also provides crucial foraging habitat, inter-nesting habitat, and migratory habitat for adult loggerheads off the east coast of the United States. The predominate foraging areas for western North Atlantic adult loggerheads are found throughout the relatively shallow continental shelf waters of the United States, Bahamas, Cuba, and the Yucatán Peninsula, Mexico. Adult loggerheads are known to make extensive migrations between foraging areas and nesting beaches, and seasonal migrations of adult loggerheads along the mid- and southeast coasts of the United States have also been documented.

Loggerheads face threats on both nesting beaches and in the marine environment. The greatest cause of decline and the continuing primary threat to loggerhead turtle populations worldwide is incidental capture in fishing gear, primarily in longlines and gillnets, but also in trawls, traps and pots, and dredges.

Directed harvest for loggerheads still occurs in many places (for example, the Bahamas, Cuba, and Mexico) and is a serious and continuing threat to loggerhead recovery.

- **Green Sea Turtle**

While breeding populations of green sea turtles off of Florida and Mexico are considered federally endangered, those in the rest of this species' range are listed as threatened under the Endangered Species Act by NOAA National Marine Fisheries (NOAA 2012a). They are classified as globally endangered by the IUCN International Union for the Conservation of Nature (IUCN).

Green turtles are the largest of all the hard-shelled sea turtles. They are globally distributed and generally found in tropical and subtropical waters along continental coasts and islands of more than 140 countries. Nesting occurs in over 80 countries throughout the year (though not throughout the year at each specific location). In Atlantic and Gulf of Mexico waters of the United States green turtles are found in inshore and nearshore waters from Texas to Massachusetts, the Virgin Islands, and Puerto Rico.

They use three different habitats during their life cycle – beaches for nesting, the benthic habitat of coastal areas for feeding, and the open ocean for travel and maturing into adulthood.

While nesting season varies from location to location, in the eastern United States females generally nest in the summer between June and September; peak nesting

occurs in June and July. During the nesting season, females nest at approximately two-week intervals. They lay an average of five nests. In Florida green turtle nests contain an average of 135 eggs, which will incubate for approximately two months before hatching.

Adult females migrate from foraging areas to mainland or island nesting beaches and may travel hundreds or thousands of kilometers each way. After emerging from the nest, hatchlings swim to offshore areas, where they are believed to live for several years, feeding close to the surface on a variety of pelagic plants and animals. Once the juveniles reach a certain age/size range, they leave the pelagic habitat and travel to nearshore foraging grounds. Once they move to these nearshore benthic habitats, adult green turtles are almost exclusively herbivores, feeding on sea grasses and algae.

Analyses of historic and recent abundance information by the Marine Turtle Specialist Group of the IUCN indicates that extensive population declines have occurred in all major ocean basins over approximately the past 100 to 150 years. Analysis of population trends at 32 index nesting sites around the world has found a 48 to 65 percent decline in the number of mature females nesting annually over the past 100 to 150 years.

The principal causes of the decline are harvest of eggs and adults on nesting beaches and harvest of juveniles and adults on feeding grounds. Incidental capture in fishing gear, primarily in gillnets, but also in trawls, traps and pots, longlines, and dredges is a serious ongoing source of mortality that also adversely affects the species' recovery.

- **Leatherback Turtle**

The leatherback is the largest turtle – and the largest living reptile – in the world and is endangered throughout its range. Leatherbacks are commonly known as pelagic (open ocean) animals, but they also forage in coastal waters. They are the most migratory and wide ranging of sea turtle species.

Female leatherbacks lay clutches of approximately 100 eggs on sandy, tropical beaches. Females nest several times during a nesting season, typically at 8- to 12-day intervals. After 60 to 65 days, leatherback hatchlings emerge from the nest. No nesting areas are known to exist on the east coast north of Florida, although migrating leatherbacks have been sighted along the entire continental coast of the United States as far north as the Gulf of Maine and south to Puerto Rico, the U.S. Virgin Islands, and into the Gulf of Mexico.

The Atlantic Ocean population is generally larger than the Pacific Ocean population. While the IUCN notes Pacific nesting populations have declined more than 80 percent, declines on the Atlantic side and in the remainder of the leatherback's range are not as severe, and some population trends are increasing or stable. Nesting on beaches of the United States has been increasing in recent years.

Leatherback turtles face threats on both nesting beaches and in the marine environment. The greatest causes of decline and the continuing primary threats to leatherbacks worldwide are long-term harvest and incidental capture in fishing gear. Harvest of eggs and adults occurs on nesting beaches while juveniles and adults are harvested on feeding grounds. Incidental capture primarily occurs in gillnets, but also in trawls, traps and pots, longlines, and dredges. Together these threats are serious ongoing sources of mortality that adversely affect the species' recovery.

- **Kemp's Ridley Sea Turtle**

Kemp's Ridley sea turtle is endangered throughout its range. It is the smallest of the sea turtles (NOAA 2012a). It breeds en masse off a particular nesting beach near Rancho Nuevo, Mexico, in the state of Tamaulipas each year. Adult females migrate but only as far north as Florida. Male adults remain in the Gulf of Mexico. Newly emerged hatchlings inhabit a much different environment than adult turtles. After emerging from the nest, hatchlings enter the water and must swim quickly to escape near shore predators. Some hatchlings remain in currents within the Gulf of Mexico while others are swept by the Gulf Stream out of the Gulf of Mexico, around Florida, and into the Atlantic Ocean.

Juveniles of many species of sea turtles have been known to associate with floating sargassum seaweed, utilizing the sargassum as an area of refuge, rest, and/or food. This developmental drifting period is hypothesized to last about two years or until the turtle reaches a carapace length of about 8 inches (20 cm). Subsequently, these sub-adult turtles return to nearshore coastal zones of the Gulf of Mexico or northwestern Atlantic Ocean to feed and develop until they reach adulthood.

The nesting population of Ridley's has experienced dramatic declines in the past 60 years, falling from 42,000 in 1947 to 2,000 in 2000. Much of this decline was due to egg collection by the local villagers until nesting beaches were afforded official protection in 1966. Approximately 8,000 nests were observed in 2003 and 2006, suggesting that protection measures are helping. The greatest threats remain incidental capture in fishing gear (primarily in shrimp trawls, but also in gill nets, longlines, traps, and pots), as well as dredges in the Gulf of Mexico and North Atlantic.

### 3.7.4 WHALES

- **North Atlantic Right Whale**

The Northern right whale is endangered throughout its range (NOAA 2012a). Unlike other baleen whales, right whales are skimmers; they feed by removing prey from the water using baleen while moving with their mouth open through a patch of zooplankton. The primary food sources are zooplankton, including copepods, euphausiids, and cyprids.

Females give birth to their first calf at an average age of 9 to 10 years. In the coastal waters off Georgia and northern Florida, calving occurs from December through March. Although they primarily occur in coastal or shelf waters, movements over deep waters are known. For much of the year, their distribution is strongly correlated to the distribution of their prey. During winter, most right whales occur in lower latitudes and coastal waters where calving occurs. The whereabouts of much of the population during winter remains unknown, although a few juvenile right whales are known to winter at the mouth of the Chesapeake Bay. Right whales are often seen off the coast of the seashore, particularly during their migration to and from calving areas in the southeastern coastal waters to summer feeding and nursery grounds in New England.

It is believed that in the western North Atlantic along the coast of the United States population numbers are about 300 to 400 individuals. Recent analysis of sightings data suggests a slight growth in population size, although the population remains critically endangered.

The most common human causes of serious injury and mortality of western North Atlantic right whales are ship collisions and entanglement in fishing gear. Additional threats include pollutants, climate and ecosystem change, noise, whale watching activities, and natural threats from predators.

- **Humpback Whale**

The humpback whale is endangered throughout its range. Humpback whales are well known for their long pectoral fins, which can be up to 15 feet (4.6 m) in length (NOAA 2012a). While feeding and calving, humpbacks prefer shallow waters. They also stay near the surface of the ocean while migrating, making them particularly susceptible to injury from ship strikes.

During the summer months, humpbacks spend the majority of their time feeding and building up fat stores (blubber) from which they will live during the winter. Humpbacks filter feed on tiny crustaceans (mostly krill), plankton, and small fish, and can consume up to 3,000 pounds (1360 kg) of food per day. In their wintering grounds, humpbacks congregate and engage in mating activities. Gestation lasts for about 11 months. Newborns are 13 to 16 ft (4 to 5 m) long and grow quickly. Weaning occurs between 6 and 10 months after birth.

In the western north Atlantic Ocean, humpback whales feed during spring, summer, and fall over a range that encompasses the east coast of the United States (including the Gulf of Maine), the Gulf of St. Lawrence, Newfoundland/Labrador, and western Greenland. In winter, whales from the Gulf of Maine mate and calve primarily in the West Indies. Not all whales migrate to the West Indies every winter; significant numbers of animals are found during winter in mid- and high-latitude regions. As immature right whales, humpbacks winter at the mouth of Chesapeake Bay and migrate through ocean waters off Assateague Island.

Humpback whales face a series of threats including entanglement in fishing gear, ship strikes, whale watch harassment, habitat impacts, and harvesting. Despite these threats, international whaling treaties have helped humpbacks to increase in abundance in much of their range. For the North Atlantic, the best available estimate is 11,570 whales.

- **Sperm Whale**

Sperm whales are endangered throughout their range (NOAA 2012a). Sperm whales (*Physeter macrocephalus*) are the largest of the toothed whales. In winter North Atlantic sperm whales are concentrated east and northeast of Cape Hatteras. In spring, the center of distribution shifts northward to east of Delaware, Maryland, and Virginia, and is widespread throughout the central portion of the Mid-Atlantic bight and the southern portion of Georges Bank. In summer, the distribution is similar but also includes the areas east and north of Georges Bank and into the Northeast Channel region, as well as the continental shelf south of New England. In the fall sperm whale occurrence south of New England on the continental shelf is at its highest levels; some whales also occur offshore of the seashore at the edge of the continental shelf in the Mid-Atlantic Ocean

The greatest threat for sperm whales has been whaling. Currently, most countries abide by a moratorium against whaling implemented in 1988, although there is some evidence suggesting illegal hunting of sperm whales in some parts of the world. At present, because of their general offshore distribution, sperm whales are less likely to be impacted by humans, and those impacts that do occur are less likely to be recorded. The best available abundance estimate for sperm whales in the North Atlantic along the coast of the United States is 4,700.

## 3.8 Historic Structures

### 3.8.1 ASSATEAGUE BEACH U.S. COAST GUARD STATION

The Assateague Beach U.S. Coast Guard Station was built in 1922. It was located across from the site of the original Assateague Beach Life-Saving Station, one of eight life-saving stations along the Atlantic Coast built between 1874 and 1906 between Cape Henlopen, Delaware, and Cape Charles, Virginia. The U.S. Coast Guard operated the station from 1922 to 1967, when it was decommissioned. After decommissioning the NPS took possession of the site. The NPS currently uses the station for general storage but is seeking to identify appropriate adaptive uses.

The station and its five associated structures are on the seashore's *Final List of Classified Structures* (NPS 1995b) and have been determined eligible for listing on the *National Register of Historic Places*. The complex of buildings is architecturally significant as a representative example of early 20th century U.S. Coast Guard buildings constructed primarily to execute the boat and life rescue service provided along the coastline. As a

Assateague Island National Seashore
**Other Important Resources – Cultural Resources**

The seashore contains a variety of locally, regionally, and nationally significant cultural resources, ranging from historic structures to archeological objects and sites. These structures and sites, as well as the associated documents and objects, are all that remain from the relatively brief periods when humans occupied Assateague Island. Combined, the seashore's cultural resources tell the story of mankind's inability to establish a permanent foothold on the constantly changing barrier island.

type of building, their simple frame construction takes a vernacular form which reflects some influence of the Colonial Revival style, indicative of their period of design. Originally designed to launch hand-rowed rescue boats directly into the ocean surf, the station evolved to use motorized vessels but eventually became obsolete in the 1960s with the advent of larger and deeper-draft rescue boats. The station is also listed as a Virginia State Historic Landmark. Five structures contribute to the site's significance.

**Station House.** The station house served as headquarters for Coast Guard operations at Assateague Beach. It is a plainly detailed rectangular structure facing the Atlantic Ocean, which is approximately 150 yards to the south. The structure is in relatively good condition. It represents a fine example of a period Coast Guard station located in a protected area from which crews could perform rescue operations.

**Station Boathouse**. The boathouse was the hub of Coast Guard operations and provided a dry storage area for boats and space for working on them. It is a hip-roofed rectangular structure, standing on pilings at the edge of Toms Cove to the north of the station house. The structure, which was in fair condition in 2010 at the time of the most recent assessment, is an excellent example of a colonial revival-type boathouse.

**Station Garage**. The garage was the original boathouse for the station. It is a rectangular hip-roof structure located approximately 100 yards to the south of the station house. The structure which was in good condition in 2010 at the time of the most recent assessment.

**Guard Tower**. The guard tower was built in 1922 and enlarged from two to three stories in 1938. Before radar, the tower served to direct vessels from dangerous shoals and to keep a look out for vessels in distress. During World War II, the tower was used for 24-hour surveillance. The tower was in good overall condition in 2010 at the time of the most recent assessment.

**Wharf and Breakwater**. The wharf and breakwater provided access to the boathouse and supported boating operations of the U.S. Coast Guard. The structures have suffered damage from multiple storms, particularly the most seaward portions, and are in poor condition overall.

### 3.8.2 GREEN RUN LODGE

Waterfowl hunting was and still is a popular form of recreation along the Mid-Atlantic seaboard from the Canadian Maritime Provinces to the Florida Everglades. Starting as subsistence hunting and commercial or "market gunning," waterfowl hunting reached its peak as a recreational sport in 1939 with over 44,000 waterfowl sportsmen and nearly 3,000 waterfowl hunting clubs and privately owned hunting marshes (Eshelman et al 2004). Since the late 1930s, the loss of eelgrass due to blight in the 1920s, the Great Depression, and severe storms along the Mid-Atlantic have contributed to decline of traditional waterfowl hunting and their associated clubs and lodges.

Figure 3.5
Cultural Resources
Historic Structures
Assateague Beach U.S. Coast Guard Station (determined eligible for the National Register)
Green Run Lodge (determined eligible for the National Register)
Pope's Island Lifesaving Service Station Boat House (determined not eligible for the National Register)
Seaboard Oil and Guano Company Fish Factory Ruins (determined not eligible for the National Register)
Archeological Resources
U.S. Lifesaving Service Sites (determined not eligible for the National Register)
Late 19th and Mid 20th Century Development Sites (determined not eligible for the National Register)
Cultural Landscapes
Assateague Beach U.S. Coast Guard Station (determined eligible for the National Register)
Museum Collection Storage Sites
Visitor Center
Park Headquarters
Seashore Circulation
Frontcountry Roads
Backcountry Roads
Trails
Assateague Island National Seashore Boundary
Assateague State Park Boundary
Chincoteague National Wildlife Refuge Boundary
Miles
0
2
4
6
Berlin
Ocean City
Ironshire
113
376
611
Park Headquarters
Visitor Center
North Beach (1884-1952)
Pope's Island Lifesaving Service Station Boat House (relocated from original site near MD/VA state line)
Pope's Island
Birch Saltworks
Chincoteague Bay
OSV USE AREA
Green Run
Scott's Ocean House Hotel
Green Run Lodge
Green Run Cemetery-Green Run Village
Stockton
WORCESTER COUNTY
679
Purnell Bay
MARYLAND
VIRGINIA
Pope's Island
ACCOMACK COUNTY
Sinnickson
Atlantic Ocean
Horntown Landing
Chincoteague Bay
Oyster Bay
Assateague Village
175
Chincoteague
Assateague Beach Lifesaving Service Station
Seaboard Oil and Guano Company Fish Factory Ruins
Toms Cove
Chincoteague Inlet
Toms Cove
Assateague Beach U.S. Coast Guard Station Cultural Landscape
Assateague Beach U.S. Coast Guard Station Historic Structures
Land Owned by NPS

Remnants of several former lodges remain at the seashore. A cultural landscape and architectural survey conducted in 2000 provided a basis for evaluating the eligibility of each lodge property for the *National Register of Historic Places*. To assist in that process, a historic context study was completed that provided information against which each of the properties (and associated landscapes) was evaluated to determine their eligibility (NPS 2004). Based upon these studies the NPS in consultation with the Maryland State Historic Preservation Officer (MD SHPO) determined that Green Run Lodge is the only former lodge on the island that is eligible for listing on the *National Register of Historic Places*.

Green Run Inlet was first hunted from floating shanty boats about 1924. In 1946 a shanty boat was pulled up on land to create Green Run Lodge, the first land-based hunting lodge at Assateague Island, located at a site about one mile north of the present lodge location. The original lodge burned around 1952, after which the surviving structures, a shanty boat, and several other small structures from elsewhere on the island were moved to the present location and connected to form the lodge that remains today. At least one component is believed to be the kitchen of the former Green Run Lifesaving Service Station.

The Green Run Lodge property was used for commercial waterfowl hunting, game hunting, and fishing. It played a significant role in the history of hunting on Assateague and helped popularize the island and Chincoteague Bay as a hunting destination during the mid-20$^{th}$ century. During the 1940s and 50s, Green Run Lodge was the largest waterfowl hunting lodge on the island and a focal point of outside interest. The lodge was described as “one of the finest commercial clubs in the country” and “one of the finest gunning spots in the east.” It was considered the largest commercial gunning club in Maryland. After moving the lodge from its original location to its present location in 1954, the property was used as a private hunting membership club. The owners sold the property to the federal government in 1972, retaining rights to continue to operate the club for many years afterward. Throughout its period of occupancy the lodge was used exclusively as a hunting camp and was never adapted for a different use.

The lodge complex includes a clubhouse, two small wood frame sheds, a dock/pier with covered storage, a breakwater, boat docking slips, and a boardwalk along the shore connecting to a decoy shed. The clubhouse is a one- and two-story frame structure, approximately 1,765 square feet in size with seven rooms, including a clubroom, gear room, three bedrooms, full bath, hall and kitchen on the first floor, and one large bedroom on the second floor. The exterior is finished in asphalt siding over clapboard and board and batten; the roof is a combination of asphalt, metal and cedar shingle, reflecting characteristics of the component parts.

Green Run Lodge is significant as a representative example of waterfowl hunting camps associated with historical commercial and recreational hunting on Assateague Island (NPS 2011h). It retains a significant amount of its original fabric, demonstrates distinctive methods of construction and creative use of materials that is typical of island

hunting camps, and epitomizes the relationship of waterfowl hunting camps to the water and marsh habitats frequented by wintering populations of ducks and geese. The landscape surrounding the lodge remains essentially unchanged from its period use and exhibits all of the natural features of barrier island bayside habitat. The view from the lodge is striking and its inherent connection to the adjacent marsh and bay waters is entirely characteristic of the island's former waterfowl hunting camps.

### 3.8.3 OTHER STRUCTURES FROM THE HISTORIC PERIOD

Three other structures remain from the seashore's historic period: Green Run Cemetery, the Pope Island Boat House, and the remains of the Seaboard Oil and Guano Company Fish Factory. Each structure is on the seashore's *Final List of Classified Structures* (NPS 1995b), but each has been determined ineligible for listing on the *National Register of Historic Places*. The cemetery is a remnant of the former Green Run Lifesaving Service Station and associated village. The Pope Island Boat House was moved to its present location in the North Beach area of the seashore in 1978 after fire destroyed the remainder of the Pope Island Lifesaving Service Station in 1972. Portions of concrete foundations and masonry walls are all that remain of the Seaboard Oil and Guano Company Fish Factory; the remains are currently located in the shallow waters of Toms Cove.

## 3.9 Cultural Landscapes

### 3.9.1 ASSATEAGUE BEACH U.S. COAST GUARD STATION CULTURAL LANDSCAPE

The most important cultural landscape at the seashore is associated with the Assateague Beach U.S. Coast Guard Station at Toms Cove (NPS 2004). It is an individual landscape within the seashore. The station landscape remains largely unchanged from the period of U.S. Coast Guard activity and is integral to understanding the history and evolution of the station. Views to and from the station add to the story of the U.S. Coast Guard history by providing a visual of how life may have been for the life-savers working on an isolated barrier island along the Atlantic coast.

In 2004, the station landscape and its features were found to be in fair overall condition and determined eligible for listing on the *National Register of Historic Places*. The Virginia SHPO concurred with the eligibility determination. Features contributing to the significance of the station landscape include all structures (exclusive of the generator house and power poles), vegetation (exclusive of junipers), all external views and vistas, and a few small-scale features.

### 3.9.2 ASSATEAGUE ISLAND CULTURAL LANDSCAPE

The Assateague Island cultural landscape is a representative Atlantic coast barrier island. The landscape encompasses the full range of natural resources found on the island, in the water, and on the marshes surrounding the island. It exemplifies the continual

changes that occur along a barrier island of the Mid-Atlantic Coast, where extraordinarily dynamic geomorphological processes occur. The action of wind, tides, waves, and currents generate periodic episodes of erosion and deposition which change the configuration of the barrier island within periods ranging from centuries to hours, affecting the cultural land use and altering the cultural landscape in short intervals. The communities that developed on Assateague Island in the 19th to early 20th centuries from the salvage industry, the life-saving stations, the resort industry, and oil and guano operations have succumbed to the environment. Moving sands have inundated the remains of many of these sites, although some remain relatively intact. Human actions, including vandalism, salvage, and looting have also heavily impacted the sites.

## 3.10 Wilderness

### 3.10.1 POTENTIAL AND RECOMMENDED WILDERNESS

The Wilderness Act of 1964 (Public Law 88-577) directs the Secretary of the Interior to review road-less areas of 5,000 contiguous acres or more in units of the national park system, and provide the President of the United States with a recommendation as to the suitability of each area for preservation as wilderness.

A study evaluating the suitability of portions of Assateague Island, Maryland, and Virginia for wilderness designation was completed by the NPS and Bureau of Sport Fisheries and Wildlife in 1974. The study concluded that portions of the island retained "primeval character and influence" and that about 6,500 acres of land qualified for wilderness designation. The proposed area included approximately 1,300 acres of US FWS managed lands in Virginia, and approximately 5,200 acres of NPS managed lands in Maryland. The study clarified that "utilization of the shellfish resources would not be affected nor would fishing or the use of navigable waters." Public response to the study's recommendations was mixed but largely positive.

Of the 5,200 acres of NPS managed lands determined suitable, 440 acres were formally recommended to Congress for wilderness designation by President Gerald Ford in 1974. The balance of the NPS managed lands – 4,760 acres – were identified as a "potential wilderness addition", to become eligible for wilderness designation when nonconforming features and uses were eliminated. Congress failed to act on the President's recommendation.

Subsequent attempts to introduce legislation designating an Assateague wilderness were abandoned with the passage of Public Law 94-578. The act amended the seashore's enabling legislation and directed the NPS to prepare a "comprehensive plan for the protection, management, and use of the seashore". The question of wilderness was to be considered as part of the ensuing GMP.

The 1982 GMP identified the presence of retained rights of use and occupancy by 11 former property owners as the most significant impediment to wilderness designation. Other considerations included the incompatibility of OSV use within the wilderness area

and concern that designation would preclude existing methods of access for recreational purposes. The GMP concluded that "when the natural zone is free of retained rights, wilderness designation will be reconsidered." The last of the retained rights of use and occupancy expired in 2002.

### 3.10.2 CURRENT CONDITIONS

The Maryland portion of the Assateague Island's recommended and potential wilderness lies roughly in the center of the island, stretching from Fox Hills south to the Maryland/Virginia state line. Because of its relatively isolated location, the wilderness area has historically received less intense use than other parts of the island. Contemporary use of the seashore follows a similar pattern and, except for OSV use along the ocean beach, the area experiences relatively limited visitor use.

At the time of the original study, it was estimated that the Maryland portion of the recommended and potential wilderness area encompassed approximately 5,200 acres of land. Recent analysis using 2008 aerial photography and GIS technology has determined that the actual acreage within the wilderness boundary is considerably less than the 1974 estimated approximately 4,000 acres. While some land has likely been lost through erosion of both the ocean and bayside shorelines, it is likely that the original estimate was significantly inflated.

Within the recommended and potential wilderness area, management actions by the NPS since the initial study have improved conditions and reduced impacts to wilderness character. During the 1970s, more than 680 acres of the island were legally available for OSV use, much of which was located in sensitive interior and bayside habitats within the wilderness area. Since then, the extent of the island open to public OSV use has been progressively reduced. At present, public OSV use is limited to the ocean beach below the winter storm berm and to two cross-island bayside access sand trails. The cumulative result has been a four-fold reduction in the wilderness lands affected by OSVs.

Other significant management actions have included removal of more than 15 miles of overhead power lines that served the former retained rights properties, and the abandonment of more than 13 miles of backcountry roads, including the former 'Back Trail'. Many of these closed roads are rapidly revegetating and becoming indistinguishable from adjacent unaffected areas. In both cases, the removal of visual intrusions and incompatible use yielded dramatic improvements in the condition of wilderness lands.

While management actions have improved conditions in many areas, much of the Assateague Island's potential and recommended wilderness continues to be affected by incompatible features and uses. The following describes some of the existing impacts and the approximate acreage affected:

- **Backcountry Roads.** The wilderness area contains approximately 9.3 miles of backcountry roads, including a mix of abandoned roads not yet rehabilitated and roads that remain in intermittent use for administrative purposes. As of 2011, approximately 81 acres of potential wilderness lands were impacted by the presence of roads (acres = land within 35 feet of road centerline as determined by GIS analysis).
- **Oversand Vehicle Use.** Public OSV use is currently permitted within the potential wilderness area in a designated zone that includes the ocean beach below the winter storm berm and two cross-island bayside access sand trails. As of 2011, approximately 256 acres of wilderness lands are impacted by the presence of OSV use (acres = lands in the designated OSV use area plus a 50 foot buffer as determined by GIS analysis).
- **Retained Rights Properties**. Six former retained rights properties occur in the wilderness area. Unnatural features associated with these properties include structures, roads, bridges, docks and boathouses, and semi-permanent duck blinds. As of 2011, approximately 45 acres of potential wilderness lands are impacted by the presence of unnatural features (acres = lands within 300 feet of former retained rights structures or significant infrastructure as determined by GIS analysis).
- **Mosquito Ditches**. Mosquito control programs during the 1940s led to construction of ditches which continue to affect Assateague's bayside marshes. As of 2011, approximately 812 acres of potential wilderness lands are impacted by mosquito ditches (acres = salt marsh habitat influenced by mosquito ditches as determined by GIS analysis).
- **Non-native Invasive Plants**. Several non-native invasive plants occur at levels that have displaced native species and altered natural communities on Assateague Island. As of 2011, approximately 880 acres of potential wilderness lands are impacted by non-native invasive plants (acres = lands where invasive plants exceed 3 percent cover as estimated by sampling and GIS analysis).

In total, approximately 2,074 acres or 51 percent of the land within the Assateague Island's potential wilderness are affected by unnatural conditions or incompatible uses, and currently fail to meet desired conditions.

### 3.10.3 MANAGEMENT OF VISITOR USE

Most visitor use activities within the recommended and potential wilderness area are compatible with the protection of wilderness character. Contemporary uses include hiking, fishing, swimming, camping, hunting, nature photography, wildlife viewing, and seeing and experiencing natural barrier island conditions. The primary challenge regarding public use is not what visitors are doing but, rather, how they access the wilderness area.

Most visitors to the Assateague Island wilderness gain access via OSVs. The use of OSVs to access remote portions of Assateague Island has been occurring since well before the

seashore's establishment. Concern that wilderness designation would restrict the use of OSVs was the predominant issue during public hearings regarding creation of the Assateague Island Wilderness in the 1970s. Little has changed since then and the use of OSVs remains both the most serious impact to wilderness character and the greatest obstacle to public acceptance of wilderness designation.

Public OSV use is allowed by special use permit in a designated zone along the ocean beach below the winter storm berm and on two cross-island bayside access sand roads. The use of OSVs is regulated under special park regulations found in 36 CFR 7.65(b), which includes provisions for use limits, conditions of use, equipment requirements, and permit requirements. Limited OSV use outside the public OSV use area is also allowed on a seasonal basis to support the public hunting program. Registered deer and waterfowl hunters are allowed to drive into the interior of the island from the public OSV use area at four locations where off-beach, hunter-only parking is provided. In addition, a portion of Valentines Road is available for use by mobility impaired deer hunters, as well as waterfowl hunters accessing blind sites.

### 3.10.4 MANAGEMENT OF ADMINISTRATIVE ACTIVIITES

NPS management activities within the wilderness area have traditionally been conducted with limited consideration of their effects on wilderness character. Beginning with the closure of the former 'Back Trail' in 1999 and continuing to the present, there has been a concerted effort to reduce the scope of incompatible administrative activities, including the use of motorized vehicles on wilderness lands. In 2010, the NPS developed a guidance document for use and management of the OSV use area and other backcountry roads. The directive formally discontinued all administrative use on some of the existing roads, and limited the types and frequency of use allowed on the remainder. At present, there are two categories of administrative use on existing roads within the wilderness area:

- **Limited Administrative Use** – includes existing sand roads providing access to three backcountry campsites and the Green Run and Valentines retained rights properties. Administrative use is limited to access for campground maintenance, resource and visitor protection patrols, emergency response, hunting management, and certain resource management activities.
- **Restricted Administrative Use** – existing sand roads providing access to the Clements and Peoples & Lynch retained rights properties. Administrative use is limited to access for periodic road maintenance (mowing) and cultural resource management activities.

## 3.11 Seashore Operations

### 3.11.1 OPERATIONAL STAFFING AND FUNDING

The seashore is managed by the superintendent and a senior management team consisting of the heads of the seashore's five operational divisions – administration, maintenance, interpretation and education, resource and visitor protection, and resource management. Each division is staffed with a combination of permanent and temporary employees. In FY 2012, the seashore's staff included approximately 41 FTE (full time equivalent) of permanent staff and an additional 36 FTE of temporary staff, primarily summer employees.

The seashore's annual operating revenue comes from various sources, the largest of which is the park's portion of the annual federal appropriation for operation of the national park system (ONPS). In fiscal year 2014, the seashore received $5,255,000 in ONPS funding. Other sources of annual operating funds include revenue from special use permits (e.g. OSV use permits), commercial use permits, reimbursable agreements with other federal agencies (e.g. US FWS), and rental income for the use of government housing. Collectively, these funds are used to conduct the seashore's day-to-day operations. Approximately 70 percent of the annual operating funds support personnel costs associated with the seashore's permanent employees and a portion of the temporary staff. The balance pays for recurring fixed costs such as utilities, vehicle fuel and maintenance, supplies and materials, and recurring management programs such as the north end Restoration and certain long-term resource monitoring activities.

The U.S. Government Accountability Office (GAO), in its report *Major Operational Funding Trends and How Selected Park Units Responded to those Trends for Fiscal Years 2001 through 2005* noted that " ... each unit experienced an increase in daily operations allocations, but most experienced a decline in inflation-adjusted terms." Congress later confirmed the GAO findings, noting in the House Report for Fiscal Year 2007 Appropriations Bill for the NPS that, "Unfortunately, because of inadequate budget requests, the parks have had to absorb $61,000,000 over the last six years in mandatory pay costs. This figure is exclusive of other costs impacts cited by GAO including unfunded retirement and health benefit increases, and mandates for homeland security and information technology security."

The seashore has experienced these same trends. Between 2009 and 2012, the seashore's annual ONPS appropriation has decreased by approximately 3 percent. In addition, inflation in the cost of fixed items such as fuel, utilities, supplies and materials has also impacted the seashore's annual operating budget. As a result of these factors the seashore has not been able to replace staff vacancies that have arisen over the past several years. Of the 50 permanent FTE in the seashore's approved organizational chart, only 41 FTE are currently filled. Vacant positions span the range of expertise needed to manage the seashore and include two park rangers, a heavy equipment operator, a wastewater treatment plant operator, an ecologist, and a coastal geologist. These

vacancies impede the seashore's ability to maintain public use facilities and infrastructure, complete needed resource management and stewardship activities, and provide the full range of visitor services.

The seashore also receives funds from other sources that help support non-recurring and one-time projects. The most important source is the revenue generated from recreational fees collected at the seashore. Approximately 80 percent of the revenue generated by recreational user fees (primarily entrance and camping fees) returns to the seashore for use in funding one-time projects. Fee revenue is used to support capital improvements such as the new campground office and ranger station and other facility enhancements, interpretive exhibits, educational programs, and habitat restoration projects. Fee revenue also supports much of the seasonal staff and other temporary employees hired to provide visitor services during the busy season and to help complete one-time projects. Other sources of funding for one-time actions come from NPS servicewide fund sources including those for cyclic maintenance, repair/rehabilitation, equipment replacement, and resource stewardship. The seashore also benefits from private donations, and non-NPS funding sources such as the US DOT's Federal Lands and Highways Program which helps maintain seashore roads.

### 3.11.2 OPERATIONS, FACILITIES, AND INFRASTRUCTURE

- **Overview**

**Administration**. The seashore superintendent and senior management staff direct overall seashore operations from the headquarters complex at the seashore entrance on MD Route 611. The complex includes administrative offices and the Maryland maintenance facility.

**Operations Facilities**. The Chief of Maintenance manages the seashore's maintenance operations from the headquarters complex. Routine maintenance operations for Maryland are based in the adjoining maintenance facility which includes operations offices, storage buildings, garages, workshops, outdoor storage areas, and the Maryland District's wastewater treatment plant. A smaller facility along Bayberry Drive provides material and supply storage closer to seashore facilities at the beach and campgrounds. The Virginia maintenance facility is located on FWS property on the mainland. Most visitor use facilities (portable restrooms, showers, etc.) at Toms Cove Beach – which are now relocatable – are removed from the island to the mainland maintenance site for winter storage and before storms to prevent loss or damage.

**Interpretation and Visitor Services Facilities**. The Chief of Interpretation and supporting administrative staff manage the seashore interpretive and visitor services from seashore headquarters. Rangers manage programs at the Assateague Island Visitor Center (where most interpretive staff are based) and the Toms Cove Visitor Center. The two visitor centers are the primary visitor contact facilities and generally

include administrative and storage facilities that support the seashore's interpretive programs.

**Visitor and Resource Protection Facilities**. The Chief Ranger oversees the visitor and resource protection staff from administrative offices at seashore headquarters. Maryland protection operations in the field are managed from the North Beach Ranger Station. In Virginia the NPS and FWS have an agreement whereby the FWS oversees protection operations in the refuge including the Toms Cove Recreational Beach (where NPS provides recreation opportunities for visitors to the refuge). NPS rangers assigned to Toms Cove report to the FWS chief ranger and are based at the refuge's Herbert H. Bateman Educational and Administrative Center.

**Protected Beach Operations**. The seashore operates two protected beach operations, one in Maryland and one in Virginia. A Chief Lifeguard oversees this operation and reports to the Chief Ranger. Two lead lifeguards, one for each operation, provide daily supervisory direction to the 6 to 8 lifeguards stationed at each protected beach. Typically, the seashore operates lifeguard protected beaches from Memorial Day through Labor Day.

**Marine Protection Operation.** A Supervisory Park Ranger oversees the water operations activities and protection for the seashore and reports to the Deputy Chief Ranger. The seashore has several law enforcement equipped vessels for patrol and enforcement of marine laws and regulations. These vessels also conduct search and rescue operations, provide support to the hunting program, and assist federal and state cooperating agencies on a regular basis.

**Emergency Preparedness Operations**. The visitor and resource protection division responds to an average of over 1000 emergencies annually. In addition to these incidents the seashore prepares every year for significant storms, hurricanes and human caused disasters. The seashore coordinates with other regional emergency service providers and organizations on a regular basis. The Chief Ranger maintains the park's Emergency Operating Plans and related SOP's and directives. Recurring emergencies that require extensive preparedness include:

- lost person/child
- drowning or near drowning
- overdue hunter or hikers
- boating or other marine emergency
- coastal storms and hurricanes

**Housing**. Affordable housing for seasonal employees is extremely difficult to find in both Maryland and Virginia, making it quite hard to recruit lifeguards, rangers, interpretive staff, and others needed during the busy summer season. In Maryland, NPS housing includes 19 bedrooms in three dorms and two houses. In Virginia the difficulty in finding seasonal housing has been a serious problem since the Assateague Beach U.S. Coast Guard Station was closed as an NPS dormitory; currently Virginia seasonal employees are housed in an FWS bunkhouse.

A recent employee housing needs assessment certified a deficit of 17 seasonal housing units in Maryland and 14 seasonal housing units in Virginia (NPS 2011g).

**Water Supply and Wastewater Treatment Facilities**. In Maryland water is drawn from wells on the island and pumped throughout the developed area to most visitor use areas. Consumption for drinking and cold water showers is approximately 8,000 gallons per day, reduced from 18,000 gallons per day usage as a result of a recent switch from flush toilets to vault toilets at the North Beach day-use area. In the backcountry no drinking water is available. At Toms Cove Beach in Virginia, wells along the parking area perimeter provide potable water and for cold water showers.

In Maryland vault toilets are available at campgrounds, North Ocean Beach, South Beach, Bayside Picnic Area, and Old Ferry Landing. Portable toilets are available at backcountry campsites. Two dump stations are located in the Maryland developed area campgrounds. Wastewater is hauled by tanker truck to a recently upgraded wastewater treatment facility on the mainland within the headquarters complex. In Virginia, Toms Cove Beach has vault toilets that are pumped and hauled to a treatment facility at Wallops.

**Roads and Parking Facilities**. (See section 3.11.)

- **Seashore Assets Analysis**

Two considerations inform management decisions regarding operations facilities and infrastructure, referred to as "assets" by seashore managers:

- the asset's relative importance (assessed in relation to the park's purpose and expressed through the its asset priority index (API))
- the asset's condition (assessed at a particular point in time and expressed through its facility condition index (FCI))

The relationship between the two considerations defines the appropriate actions needed to protect each asset. In general, assets fall into one of four categories (table 3.6). NPS policy regarding future public investment is generally: 1) to focus on the highest priority assets that are in the poorest condition (Category 2 assets), and 2) conversely, to avoid further public investment in low priority assets, particularly if they are in poor to serious condition (Category 4 assets).

Figure 3.6 presents a graphic summary of the findings from the analysis of seashore assets. Following are the major findings from the analysis:

**Finding 1** Of the seashore's 225 assets (referred to as 'locations' in the scatter plot), 68 percent (154 of 225) are in good condition, requiring only routine preventative maintenance.

**Finding 2** Four of the seashore's assets with high APIs (>70) are in poor condition and require rehabilitation; five assets with high APIs are in serious condition.

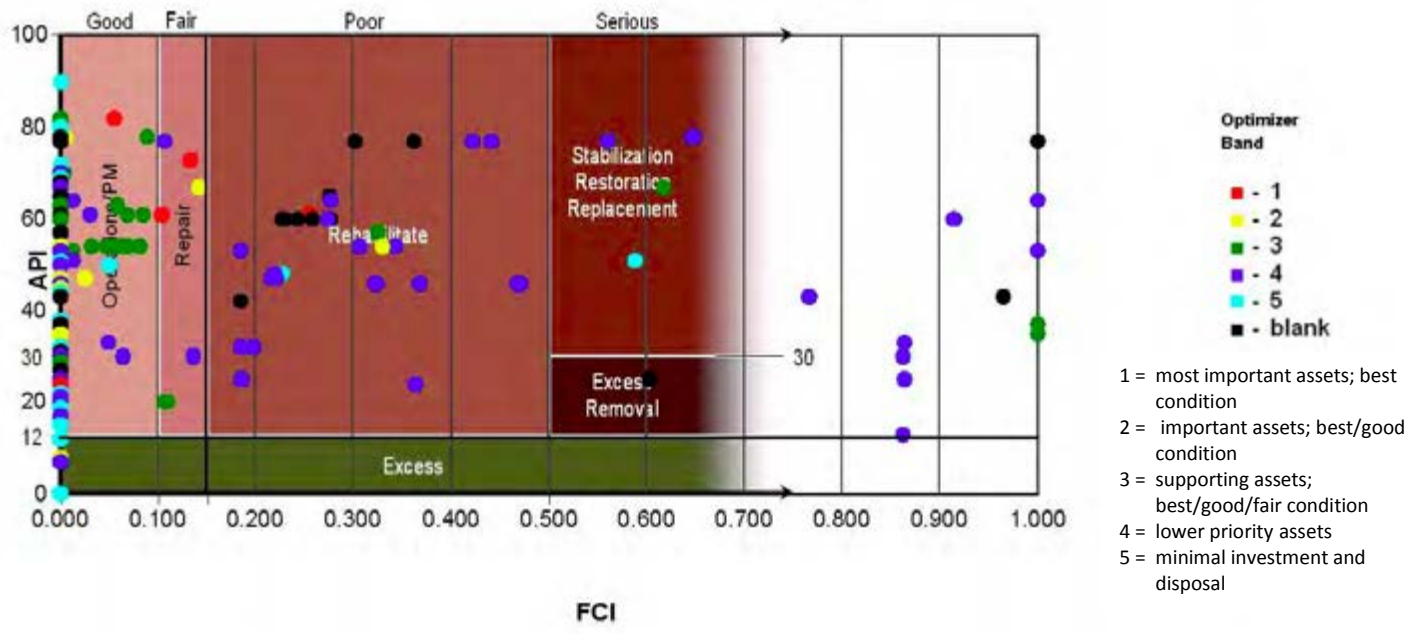
**Table 3.6**

Assateague Island National Seashore
**Generalized Seashore Asset Analysis Categories**

| | Priority* | Condition |
|---|---|---|
| **1** | high to moderate | good |
| **2** | high to moderate | fair to poor |
| **3** | fair to poor | serious |
| **4** | low | all conditions |

* *Priority expressed in relation to the seashore's purpose*

**Figure 3.6 Park Asset Analysis – Summary of Findings**




**Finding 3** Of the 32 assets in poor condition and requiring rehabilitation, 84 percent (27 of 32) are roads, parking lots, or hard surfaced trails.

**Finding 4** Twelve assets are considered obsolete or excess to the needs of the seashore, or are in such poor condition as to warrant removal

### 3.11.3 PARTNERSHIPS

- **Volunteers**

Volunteering is an American tradition that the NPS recognizes is vital to the success of its parks. The NPS Volunteers in Parks (VIP) program coordinates voluntary help and services from the public. In 2011, nearly 700 volunteers donated more than 19,500 hours of time, providing an equivalent monetary value of $396,000 (table 3.7). The volunteers contributed their expertise and assistance to a wide variety of seashore programs and activities including visitor center operations, water quality, and threatened or endangered species monitoring, interpretive and educational activities, invasive species control, litter and marine debris clean up, campground operations, horse management, and cultural resource preservation.

**Table 3.7**

Assateague Island National Seashore
**Volunteers in Park Program Participation**

| | Volunteers | Hours Donated |
|---|---|---|
| 2011 | 694 | 19,557 |
| 2010 | 613 | 14,549 |
| 2009 | 1016 | 12,592 |
| 2008 | 1,280 | 12,432 |
| 2007 | 828 | 14,676 |

- **Entities Who Help the NPS Achieve Its Mission at the Seashore**

The seashore has many successful partnerships with organizations, state and local governments, and other federal agencies that help to accomplish the seashore's mission (table 3.8). Through these relationships the seashore has received valuable assistance in the conduct of educational programs, visitor services, emergency services, resource stewardship, scientific and scholarly research, and other activities.

**Table 3.8 Entities that Help the NPS Accomplish Its Mission at Assateague Island National Seashore**

| Entity | Type of Agreement and General Provisions |
|---|---|
| **General** | |
| • **Assateague Island Alliance** | The Assateague Island Alliance is the seashore's friends group and assists the NPS by supporting interpretive, educational and scientific programs, and by helping to assure a balance between resource stewardship and compatible recreational uses of the seashore. |
| • **Eastern National** | Eastern National provides visitor services for the seashore by operating bookstores in the two NPS visitor centers under a national agreement with the NPS. Sales generated from the bookstores enable Eastern National to make donations to the seashore. |
| • **National Parks Conservation Association** | NPCA is a non-profit organization whose mission is to protect and enhance America's national parks for present and future generations. From its Virginia and Chesapeake Program Office in Washington, D.C., NPCA works to strengthen the relationship between the seashore, the general public, visitors, and neighboring gateway communities. |
| **Emergency Service Providers** | |
| • **Law Enforcement**<br>– Maryland State Police<br>– Virginia State Police<br>– Local Police Departments<br>– Maryland DNR Natural Resources Police<br>– Virginia DGIF Law Enforcement Division<br>– US Fish and Wildlife Service<br>– Worcester County Sheriff<br>– Accomack County Sheriff | Assateague Island National Seashore is a concurrent jurisdiction park. NPS has enforcement jurisdiction on Federal lands and on navigable waters within the seashore boundary. NPS, MD and VA State Police, MD DNR, VA DGIF, and local police departments have agreements to assist one another when needed. NPS provides law enforcement on federal lands inside the seashore and at its mainland facilities as well as on private land outside the seashore if there is a bona fide emergency situation.<br>In Virginia, the NPS and the FWS have an agreement whereby the FWS oversees protection operations in the refuge including the Toms Cove Recreational Beach where the NPS provides recreation opportunities for refuge visitors; FWS supervises NPS rangers assigned to the Toms Cove area. NPS and FWS have a contract with the town of Chincoteague for radio dispatching services in Virginia.<br>MD DNR Natural Resources Police and VDGIF Law Enforcement Division are responsible for enforcement of the states' wildlife and boating laws. |
| • **Fire Protection/Emergency Services/Search and Rescue/Hazardous Material Response**<br>– Berlin Fire Company<br>– US Coast Guard<br>– Chincoteague Volunteer Fire Company<br>– Maryland State Police<br>– US Fish and Wildlife Service | NPS and local volunteer and paid professional fire and ambulance companies have mutual aid agreements to provide fire protection, emergency medical services, search and rescue assistance, and hazardous material response at the seashore. MD State Police provide helicopter Med-Evac services.<br>The US Coast Guard has primary responsibility for marine search and rescue operations and marine pollution response. The NPS and state and local public safety agencies assist the Coast Guard in responding to marine emergencies.<br>The NPS and US FWS respond to wild land fires within the seashore with assistance when needed from local fire fighters. |
| **Economic Development and Tourism Organizations** | |
| • **Economic Development**<br>– Berlin Maryland Chamber of Commerce<br>– Ocean City Chamber of Commerce<br>– Worcester County Department of Economic Development<br>– Chincoteague Chamber of Commerce<br>– Eastern Shore of Virginia Chamber of Commerce | The NPS works cooperatively with local economic development organizations to promote initiatives designed to strengthen and advance the general welfare and economic prosperity of the region. |

**Table 3.8 Entities that Help the NPS Accomplish Its Mission at Assateague Island National Seashore**

| Entity | Type of Agreement and General Provisions |
|---|---|
| • **Tourism**<br>– Delmarva Low Impact Tourism Experiences<br>– Eastern Shore Tourism Commission<br>– Ocean City Department of Tourism<br>– Worcester County Department of Tourism | The NPS works cooperatively on many initiatives with local tourism groups. Initiatives focus on attracting visitors to the region, providing information to visitors, and developing visitor support services in gateway communities. |
| **Conservation Organizations** | |
| • **Maryland Coastal Bays Program**<br>– Maryland Coastal Bays Program | The seashore actively supports and benefits from the activities and initiatives of the Maryland Coastal Bays Program (MCBP). The MCBP, a component of the EPA's National Estuary Program, plays a central role in coordinating federal, state and local governments and the public in broad-based efforts to protect and conserve the waters and surrounding watershed of Maryland's coastal bays to enhance their ecological values and sustainable use for both present and future generations. |
| • **Audubon Society** | The NPS and Audubon Society collaborate in research and conservation programs of mutual interest. The mission of the Audubon Society of Maryland-DC is to restore the natural ecosystems of Maryland focusing on birds, other wildlife, and their habitats for the benefit of humanity and the earth's biological diversity. |
| • **Assateague Coastal Trust** | The NPS and Assateague Coastal Trust collaborate in conservation and environmental education initiatives of mutual interest. Assateague Coastal Trust's mission is to protect and enhance the natural resources of the Atlantic Coastal Bays watershed through advocacy, conservation, and education. |
| **Federal, State and Local Agencies** | |
| • **US Fish and Wildlife Service** | The NPS and US FWS cooperatively manage the Toms Cove recreational Beach within Chincoteague National Wildlife Refuge under a memorandum of understanding. The two agencies also partner on matters related to the overall management of Assateague Island and the adjacent coastal waters.<br>The NPS also consults with the US FWS in managing and protecting threatened or endangered species as per requirements of the Endangered Species Act. |
| • **US Army Corps of Engineers** | The NPS and USACE are partners in the north end Restoration Program as governed by an Interagency Agreement. Both agencies contribute funding to support the 25 year program intended to mitigate the impacts of the federal navigation channel at Ocean City Inlet on Assateague's sediment supply. |
| • **US Department of Agriculture** | The NPS partners with the USDA Plant and Animal Health Inspection Service to manage certain wildlife species on Assateague Island under an Interagency Agreement. |
| • **Maryland Department of Natural Resources (Maryland Park Service) – Assateague State Park** | The seashore collaborates with ASP on a variety of issues related to visitor use, resource management, and other operational issues where the agencies' interests and management responsibilities for Assateague Island intersect. |
| • **State Resource Management Agencies**<br>– MD Department of Natural Resources<br>– MD Department of the Environment<br>– VA Department of Conservation and Recreation<br>– VA Department of Game and Inland Fisheries | The NPS works with state conservation agencies on a wide range of issues of mutual concern and responsibility, including wildlife management, monitoring and protection of water quality, threatened or endangered species management, and<br>A cooperative agreement between the NPS and MD DNR facilitates collaboration in scientific research and other management initiatives. |

**Table 3.8 Entities that Help the NPS Accomplish Its Mission at Assateague Island National Seashore**

| Entity | Type of Agreement and General Provisions |
|---|---|
| • **State Transportation Departments** | The Maryland and Virginia Departments of Transportation and the NPS work cooperatively to address vehicular, bicycle, and pedestrian access to the seashore via state roads and bridges. |
| • **State Historic Preservation Officers** | The Maryland and Virginia State Historic Preservation Officers and the NPS work cooperatively to identify, preserve, and protect the cultural resources representative of the island's heritage that are found in the seashore. |
| **County Governments** | |
| • **County Governments**<br>– Worcester County, MD<br>– Accomack County, VA | The NPS collaborates with county governments on a variety of issues of mutual concern ranging from public health and safety to land use and watershed conservation planning. |
| **Academic Institutions** | |
| • **Academic Institutions**<br>– University of Maryland Horn Point Environmental Laboratory<br>– University of Maryland Eastern Shore<br>– Salisbury University | The NPS collaborates with regional universities in the development of scientific information related to the natural environment of Assateague Island and the adjacent coastal waters. The NPS also works cooperatively with academic institutions to advance learning opportunities for students of all ages through internships, environmental education initiatives, and sponsored research. |
| **Other Organizations** | |
| • **Assateague Mobile Sportfishermen's Association** | AMSA supports the mission of the seashore through a variety of local activities including environmental education, OSV user education, sponsoring beach clean-ups, community outreach, and through donations to the NPS. |

## 3.12 Access and Circulation

The seashore's access and circulation system has evolved over the years in response to the dynamic nature of the coastal environment, the growing numbers of summer visitors, and the need to protect sensitive natural resources. Within Maryland, the NPS has primary management responsibility for managing the transportation system, working in collaboration with the MD DNR and the Maryland State Highway Administration (MD SHA) which owns and manages the MD Route 611 and Verrazano Bridge. Within Virginia, the U.S. Fish and Wildlife Service (FWS) has primary management responsibility for managing the transportation system, working in collaboration with the NPS whose area of jurisdiction includes Toms Cove Recreational Beach, the Former Assateague Beach U.S. Coast Guard Station, and the two Assateague Channel bridges that connect Chincoteague and Assateague Islands.

Recent transportation studies for the Maryland and Virginia portions of the island provide information on the access and circulation infrastructure, transportation needs, and potential management actions and strategies to address transportation needs, including:

- *Assateague Island National Seashore Alternative Transportation Systems Planning Study and Business Plan for Alternative Transportation* (US DOT 2012) (prepared for the NPS through a grant from the Federal Lands Highway Program)
- *Chincoteague National Wildlife Refuge Alternative Transportation Study* (US DOT 2010) (prepared for the US FWS, the NPS, and the town of Chincoteague through a grant from the Federal Transit Administration's Alternative Transportation in Parks and Public Lands Program)

The following text describing the transportation infrastructure, transportation issues and needs, and transportation management actions and strategies for the Maryland and Virginia portions of the seashore using information has been excerpted from the two studies referenced above.

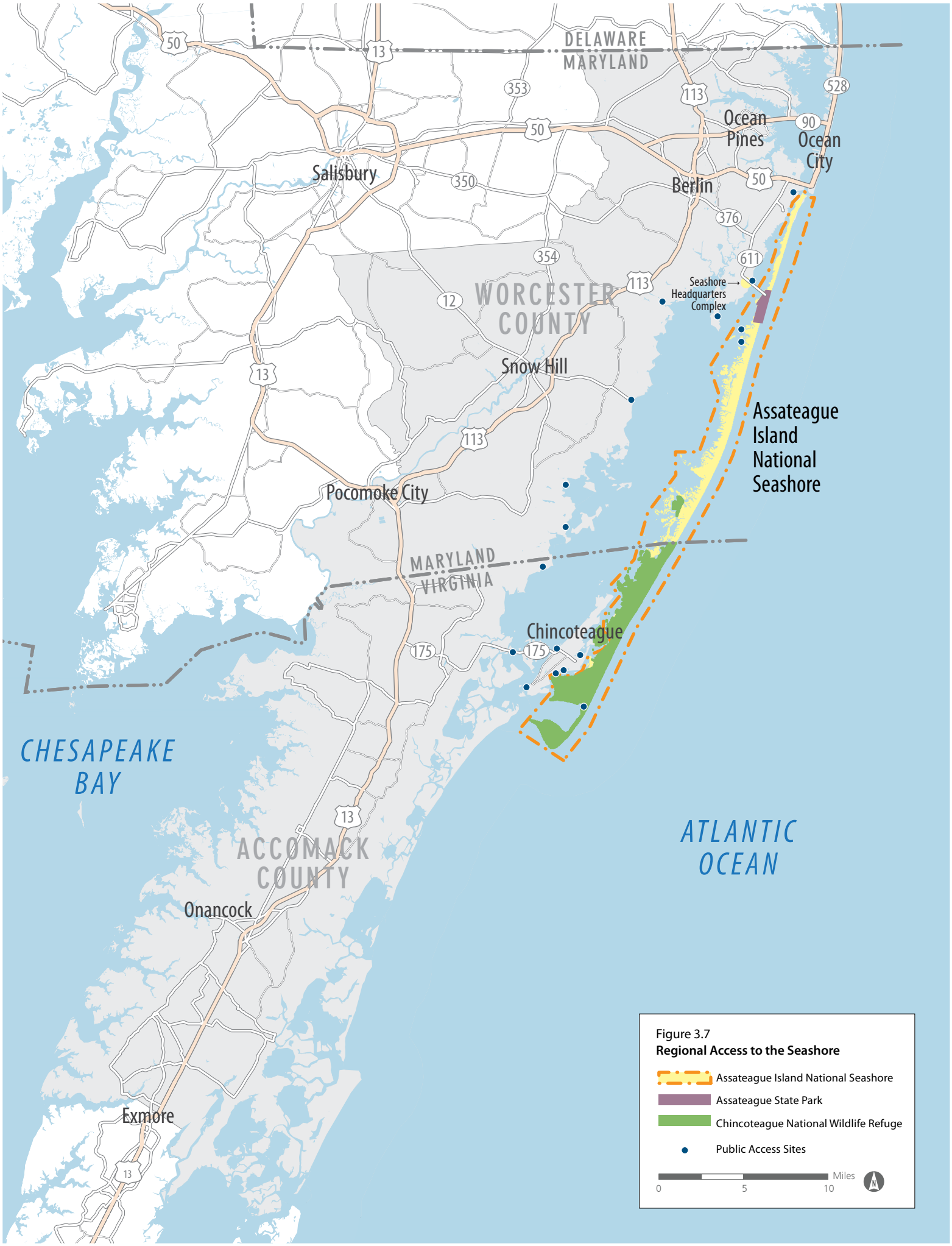
### 3.12.1 ACCESS AND CIRCULATION IN MARYLAND

- **Access and Circulation Infrastructure (Maryland)**

**Vehicular Access**. Most visitors to the seashore arrive by private vehicle, although a growing number of senior citizens arrive by motor coach and many school groups also visit by bus (NPS 2002a; Eppley Institute 2007). The primary access route from Washington, D.C. and Baltimore, the two closest major metropolitan areas, is the Chesapeake Bay Bridge along US Route 50 near Annapolis. Other driving options from the north include the Cape May-Lewes Ferry (which connects southern New Jersey to Delaware, north of Ocean City) and DE Route 1/US Route 113 from the north (which connects with Interstate 95 in Wilmington, Delaware. From the south, the only access route to the Virginia and Maryland Eastern Shores is via the Chesapeake Bay Bridge-Tunnel, which connects the Delmarva Peninsula to Norfolk, Virginia, and US Route 13, which runs the entire length of the peninsula until it merges with DE Route 1.

Regardless of origin, from the west visitors to the Maryland District access the seashore from US Route 50, either via Berlin using MD Route 376 or via West Ocean City using MD Route 611. From the south, visitors access the seashore via Snow Hill and Berlin using US 113 and MD Route 374. All visitors ultimately use MD Route 611, the only access road to the Maryland District, and the Verrazano Bridge (or the adjacent bicycle-pedestrian bridge), which connects the mainland to Assateague Island.

**Bicycle/Pedestrian Access**. Bicycles and pedestrians can access the seashore via the bicycle and pedestrian bridge that is adjacent to the Verrazano Bridge. There are 4.6 miles of paved bike path beginning at the visitor center on the mainland, crossing the pedestrian bridge on MD Route 611, and continuing on the paved bike path along Bayberry Drive and Oceanside Campground. The number of visitors who access the seashore on foot or by bicycle is also not known. Anecdotally, some visitors bicycle from Ocean City and other nearby communities, but few if any visitors arrive on foot.


DELAWARE
MARYLAND
WORCESTER COUNTY
ACCOMACK COUNTY
MARYLAND
VIRGINIA
CHESAPEAKE BAY
ATLANTIC OCEAN
Salisbury
Ocean Pines
Ocean City
Berlin
Seashore Headquarters Complex
Snow Hill
Pocomoke City
Chincoteague
Onancock
Exmore
Assateague Island National Seashore
50
13
353
113
528
90
350
376
611
354
12
175
Figure 3.7
Regional Access to the Seashore
Assateague Island National Seashore
Assateague State Park
Chincoteague National Wildlife Refuge
Public Access Sites
Miles
0
5
10

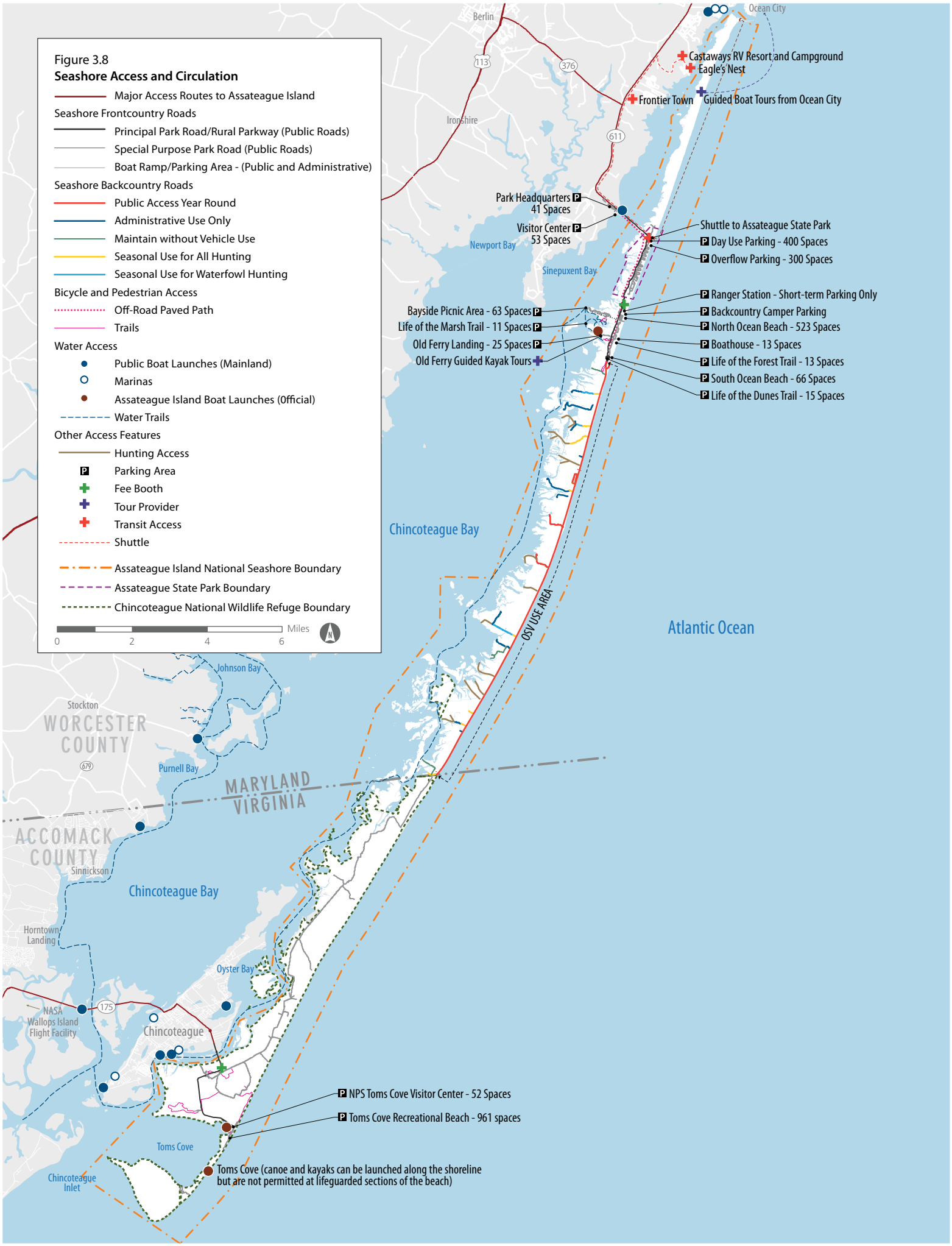


Figure 3.8
Seashore Access and Circulation
Major Access Routes to Assateague Island
Seashore Frontcountry Roads
Principal Park Road/Rural Parkway (Public Roads)
Special Purpose Park Road (Public Roads)
Boat Ramp/Parking Area - (Public and Administrative)
Seashore Backcountry Roads
Public Access Year Round
Administrative Use Only
Maintain without Vehicle Use
Seasonal Use for All Hunting
Seasonal Use for Waterfowl Hunting
Bicycle and Pedestrian Access
Off-Road Paved Path
Trails
Water Access
Public Boat Launches (Mainland)
Marinas
Assateague Island Boat Launches (Official)
Water Trails
Other Access Features
Hunting Access
Parking Area
Fee Booth
Tour Provider
Transit Access
Shuttle
Assateague Island National Seashore Boundary
Assateague State Park Boundary
Chincoteague National Wildlife Refuge Boundary
Miles
0
2
4
6
Ocean City
Berlin
Ironshire
Castaways RV Resort and Campground
Eagle's Nest
Frontier Town
Guided Boat Tours from Ocean City
Park Headquarters
41 Spaces
Visitor Center
53 Spaces
Newport Bay
Sinepuxent Bay
Shuttle to Assateague State Park
Day Use Parking - 400 Spaces
Overflow Parking - 300 Spaces
Ranger Station - Short-term Parking Only
Backcountry Camper Parking
North Ocean Beach - 523 Spaces
Boathouse - 13 Spaces
Life of the Forest Trail - 13 Spaces
South Ocean Beach - 66 Spaces
Life of the Dunes Trail - 15 Spaces
Bayside Picnic Area - 63 Spaces
Life of the Marsh Trail - 11 Spaces
Old Ferry Landing - 25 Spaces
Old Ferry Guided Kayak Tours
Chincoteague Bay
OSV USE AREA
Atlantic Ocean
Johnson Bay
Stockton
WORCESTER COUNTY
Purnell Bay
MARYLAND
VIRGINIA
ACCOMACK COUNTY
Sinnickson
Chincoteague Bay
Horntown Landing
Oyster Bay
NASA Wallops Island Flight Facility
Chincoteague
NPS Toms Cove Visitor Center - 52 Spaces
Toms Cove Recreational Beach - 961 spaces
Toms Cove
Toms Cove (canoe and kayaks can be launched along the shoreline but are not permitted at lifeguarded sections of the beach)
Chincoteague Inlet

Worcester County and Ocean City have developed bicycle maps that identify several bike routes that provide connections to MD Route 611. Bike routes include portions of MD Routes 611, 50, 90, 628, 364, 354, 12, and 346. Some of these routes have limited bicycle and pedestrian infrastructure in the form of wide shoulders and striping for bicyclists. MD Route 611, the route that all visitors must take to access to the Maryland District, has limited bicycle infrastructure and as such is more suited to experienced bicyclists. The nearest activity centers are in Berlin and Ocean City, each located about eight miles from the Barrier Island Visitor Center. Casual bikers or families might not want to bike this distance and the distance is typically too long for pedestrians. There are also safety concerns along parts of the bicycle route between Ocean City and Assateague Island NS. In particular, the bridge along US Route 50, which provides the most direct route to reach the seashore, has a narrow shoulder and sidewalk, which is often frequented by fishermen.

**Motorized Water Access**. There are currently few options for motorized water transport to the seashore. Motorized boats can launch from mainland access sites at Ocean City Harbor, Assateague State Park, Public Landing, and a few other public boat launch sites along Chincoteague Bay. There are no docking facilities at the seashore. Boaters who go ashore do so by mooring offshore or by pulling their boats up onto the beach.

There are several water tour companies based out of Ocean City that pass by Assateague or land on the island for brief periods of time. These water transport operations are tourism-based and are not in business to transport visitors to the seashore who might wish to spend extended time on the beach or carry recreational equipment.

**Non-Motorized Water Access**. Canoes and kayaks can be launched from Old Ferry Landing, Bayside Picnic Area, Fox Hills bayside access road, and along the ocean beach. At Bayside Picnic Area, a concession offers canoe and kayak rentals by the hour, day, overnight, or weekend, as well as guided interpretive kayak and canoe tours every Friday afternoon in June through September. Other commercial outfitters on the mainland offer hourly and daily kayak rentals and guided tours. Some outfitters also provide a shuttle service to Bayside and Old Ferry Landing.

**Seashore Parking Areas**. The seashore has 11 parking areas open to the general public as well as additional parking facilities for employees and for campers. Most parking (over 80 percent) serves the beach but several additional areas provide access to bayside activities, trails, and other visitor attractions (table 3.9). Two parking areas are on the mainland. One provides access to the visitor center and has 53 parking spaces plus spaces for 10 buses or recreational vehicles. The adjoining headquarters complex parking area has 41 spaces that can be used for visitor center overflow.

**Seashore Entrance Booths**. Visitors entering the developed area in Maryland must pass through one of two entrance booths located two miles down Bayberry Road from the Verrazano Bridge. One booth is staffed during daytime hours; the other is commonly

**Table 3.9**

Assateague Island National Seashore
**Parking Areas (for public use)**

**Maryland Mainland**

- Visitor Center (53 auto spaces; 10 bus/RV spaces)
- Headquarters Complex (41 spaces)

**Maryland Island – Beach Parking**

- North Ocean Beach (523 spaces)
- South Ocean Beach (66 spaces)
- Ranger Station (short-term parking only)

**Maryland Island – Other Parking**

- Bayside Picnic Area (53 spaces)
- Life of Marsh Trail (11 spaces)
- Life of Forest Trail (13 spaces)
- Life of Dunes Trail (15 spaces
- Boathouse (13 spaces)
- Old Ferry Landing (25 spaces)

**Virginia District**

- Toms Cove Recreational Beach (NPS Assigned Area) (961 spaces)
- Toms Cove Visitor Center (12 spaces)

unstaffed. The unstaffed booth allows visitors with annual passes to enter more quickly by swiping their pass through a card reader; this works well except when access to the second lane is blocked by vehicles waiting to pay (typically occurring when more than 10 vehicles are in line).

**Oversand Vehicle (OSV) Use Area and Backcountry Roads**. The seashore contains a network of unpaved sand roads and ocean beach travel corridors that provide vehicular access within its boundaries. Network components generally include 1) a public OSV use area providing access along portions of the ocean beach and to the bayside of the seashore at two locations, and 2) backcountry roads providing access to additional interior and bayside locations for administrative and seasonal hunting use. Most of the existing backcountry roads are remnants of private land use occurring prior to the seashore's establishment. Similarly, use of motor vehicles to access remote portions of the seashore is a traditional activity that continues today as a popular recreational use.

OSV use at the seashore is managed to accomplish the following objectives (NPS 2010h):

- provide appropriate, resource-based recreational opportunities
- minimize the effects of oversand vehicle use on seashore resources and values
- minimize conflicts between oversand vehicle use and other uses of the backcountry
- ensure use is conducted safely and in accordance with regulations
- reduce and eliminate non-essential oversand vehicle use

The framework for managing OSV use at the seashore is provided by Executive Order 11644 (as amended by EO 11989), *NPS Management Policies* (NPS 2006c), 36 CFR§7.65(b), and the *Superintendent's Compendium* (NPS 2015d). In general, public OSV use is managed to provide safe and appropriate recreational opportunities while minimizing adverse effects on the seashore's natural, cultural, scenic and aesthetic resources, and other recreational uses. Administrative oversand vehicle use is limited to that necessary to manage public use of the OSV use area and to conduct emergency operations and other essential maintenance, resource protection, and management activities that cannot be accomplished reasonably by other means.

- **OSV Use Area**. The public OSV use area consists of a 12-mile long ocean beach driving route and two cross-island bay access roads. The OSV use area provides public access for traditional recreational activities including surf fishing, hunting, beach activities, and scenic touring. It also supports administrative activities such as resource protection patrols, research and resource management activities, and the maintenance of backcountry campsites. The primary travel corridor in the public OSV use area is the seaward portion of the ocean beach. The western limit of the route is located at or near the average winter storm tide line. This definable feature (winter storm berm) provides a point of demarcation which limits vehicular travel to that portion of the ocean beach receiving significant natural disturbance (tidal action) on an annual basis. It intentionally segregates vehicles from sensitive biological communities that

occur on the upper beach face and adjacent dune fields. The public OSV use area also includes two cross-island roads that provide access to the bay for activities such as clamming and launching non-motorized boats. The number and location of these roads was formalized in the 1980s and has remained unchanged since that time. The bay access roads are located at Fox Hills (km 23.4) and Fox Hill Levels (km 25.3).

- **Backcountry Roads**. In addition to the public OSV use area, a network of single track sand roads provides access to the Island interior and bayside at multiple points within the backcountry. In general, the use of these backcountry roads is limited to administrative activities, including resource protection patrols, research and resource management activities, access to and maintenance of backcountry campsites, and search and rescue operations. On a seasonal basis, portions of some backcountry roads are opened to registered hunters to provide off-beach parking and access for deer and upland game hunting, and access to the bayside for waterfowl hunting. The entrance to these routes is controlled through the use of gates placed at strategic locations along each backcountry road. Each is posted with an "authorized vehicles only" sign.

**Local and Regional Transit Providers**. The region has a number of public and private transit providers, but none currently directly serve the seashore.

- **Ocean City Transit**. Ocean City offers a variety of transit services for both visitors and residents traveling largely within Ocean City and West Ocean City, including the Boardwalk Tram, the Coastal Highway Transit Bus, the West Ocean City Park & Ride, and a special events trolley. None of these services provide access to the seashore.

- **Shore Transit**. Shore Transit operates regional bus services in the three counties within Maryland's Eastern Shore: Worcester, Wicomico, and Somerset. These services encompass ten bus routes. While no route directly serves the seashore, two routes serve nearby communities, including Berlin, Pocomoke, and Ocean City. These routes also serve the West Ocean City Park and Ride, where riders can make connections to Ocean City Transit and Greyhound Bus services.

- **Transit Services to Assateague State Park.** Two local commercial campground sites – Frontier Town and Castaways RV Resort and Campground (formerly Eagle's Nest) – provide shuttle service to the seashore for their guests; however, service is provided only to Assateague State Park and the shuttles do not serve Bayberry Drive or NPS facilities.

In some years, the state has cooperated with a vendor and with Ocean City Transit to provide a shuttle service for the annual Maryland Coast Day that carried visitors from satellite parking lots on the mainland to the festival.

In 1998 and 1999 a seasonal bus service called the Worcester County Ride linked campgrounds at the seashore and Assateague State Park with the South Division Street Transit Center in downtown Ocean City. The bus service, which utilized a 15-passenger van, offered three daily round-trips for a $2.00 round-trip fare and had an average of five to 10 passengers per day.

- **Transportation Issues and Needs (Maryland)**

**Regional Traffic Congestion.** Regional traffic congestion is primarily associated with beach traffic accessing Ocean City. US Route 50 becomes congested on summer weekends; signage directs travelers going to the seashore to use MD Routes 113 and 376 in order to bypass roadways congested by vehicles bound for Ocean City. It is not clear how many visitors to the seashore follow the designated route.

Traffic volumes on major roadways near the seashore are expected to increase 30 to 200 percent over the next twenty years, with likely adverse impacts on the travel experience of visitors headed for the seashore. The largest traffic growth is expected along US 113 largely due to a planned 946-acre mixed-use development in Snow Hill; however, ongoing expansion of U.S. 113 from a 2-lane to a 4-lane divided highway is expected to provide adequate capacity to mitigate the increase in traffic along this roadway.

Future anticipated changes to the transportation system have implications for planning visitor transportation to the seashore. Congestion and road design will play a role in assessing demand and route planning for public transportation, bicycle and pedestrian routes, and signage strategies.

**Seashore Entrance Booth Congestion**. Traffic congestion approaching the seashore fee booths has been a persistent issue on peak weekend days for a number of years. The queue of vehicles waiting to enter the seashore can stretch more than one-quarter of a mile from the booths. Recently completed improvements to the fee booths have enhanced the functionality of the entrance booths but have not eliminated much of the congestion during peak weekend days. Planned roadway improvements will increase the number of lanes serving the entrance booths and should help alleviate some of the current congestion.

**Circulation Congestion**. Two main challenges with traffic circulation at the seashore are visitors looking for parking and “pony jams”. NPS policy is to allow visitors to enter the seashore even when it is known that all parking is full; this leads to visitors driving around in search of parking. In addition, even when some parking is available, there is no system in place to direct visitors to available parking. Pony jams are caused when wild horses enter a parking lot or road right-of-way or when visitors pull to the side of the road or stop in the road to observe wild horses adjacent to the road. Creating additional designated pull-off areas for wildlife viewing might improve traffic circulation on the island.

**Illegal Parking**. During peak times the seashore experiences problems with illegal parking, or parking outside of designated parking areas. Illegal parking is both a safety concern and a resource management concern. It primarily occurs in and around the traffic circle at the southern end of Bayberry Drive and on Bayberry Drive between the ranger station and traffic circle. According to seashore staff, visitors park illegally in these places because there is a desire to access South Beach, which has more space for visitors to spread out and is served by significantly less parking than North Beach. Even when parking is available in the North Beach parking area, visitors choose to park at the southern end of Bayberry Drive closer to South Beach.

**Parking Demand**. While the seashore has implemented strategies to manage the illegal parking issue, the pressure for more convenient parking remains, leading some visitors to choose to park illegally. The seashore has about 770 parking spaces for day-use parking. The number of visits – an estimated 2,000 day-use vehicles – on a peak day indicates that current parking capacity is insufficient, although observed parking occupancy shows that there is some available capacity even at peak times. Not all parking is equally desirable to visitors. For example, the South Beach parking lot fills first and its popularity and small capacity is the main contributor to illegal parking.

**Regional Wayfinding**. There are some opportunities to improve both wayfinding and traveler information on the regional level. Additional signage along US Route 50, directing visitors to alternative routes for accessing the seashore may help divert traffic and reduce congestion. Web, radio, and phone systems could provide other types of information, as could the state owned variable message signs (VMS) located on US Route 50.

**On-Site Wayfinding and Traveler Information**. The NPS is pursuing opportunities for improvements in wayfinding and traveler information provision at the seashore, both on the mainland and on the island. Visitors have expressed frustration with the lack of information about the OSV use area occupancy status, weather-related beach and seashore closures, parking availability, and congestion leading to the seashore and in the parking lots. The NPS has recently installed two vehicle messaging systems; one on the mainland near seashore headquarters and one at the island entrance station. These signs provide several types of information, including OSV and parking status, and compliment the information provided at the visitor center and information provided via phone, radio or web systems

There may also be an opportunity for improvements to the signage near the parking lots on Assateague Island. Currently, signage directing visitors to parking immediately after the entrance booths is both inadequate and confusing.

Inadequate signage at the traffic circle at the south end of Bayberry Drive leads to driver confusion and misdirection, as well, and would benefit from improvements

**Emergency Evacuation**. MD Route 611 is a designated evacuation route for both Assateague Island and Ocean City; however, it is also located in a flood zone.

Emergency evacuation planning needs to ensure that the evacuation routes can accommodate the total anticipated visitors to the area.

Temporary shelter on the island is also needed to accommodate people in the event of a summer pop-up thunderstorm. Currently, there are no buildings in the Maryland District that are recommended for emergency shelter.

Merging traffic from the seashore and Assateague State Park to exit off the island is another emergency evacuation issue. Seashore traffic must turn left to merge into the access road leading to the Verrazano Bridge from Bayberry Drive, while vehicles departing from Assateague State Park have the right-of-way in proceeding straight. Actions to potentially address this issue include placement of a ranger to direct traffic during evacuations, reconfiguring or redirecting traffic to improve the merge, or reversing the eastbound lane across the Verrazano Bridge.

**Lack of Alternative Transportation**. Lack of alternative transportation options limits access to the seashore by people without a vehicle, makes it impossible for visitors with a vehicle to get to the seashore once parking capacity is reached, and generally continues to maintain high numbers of vehicles on the island. Implementation of an alternative transportation option would address many transportation issues by reducing the number of vehicles on the island, thereby reducing entrance station congestion, circulation congestion, and parking demand. It would also have a positive impact on the environment and visitor experience by reducing air pollution and ambient noise levels during peak use periods.

**OSV Use Area Management**. The NPS recently installed an automated gate system and traffic counter at the entrance to the OSV use area to better manage vehicle access. The system allows vehicles onto the beach up to the 145 vehicle limit, at which point it transitions to one-on, one-off. Planned future improvements include linking the vehicle counter with the VMS signs to provide information on OSV use area status before visitors reach the island.

### 3.12.2 ACCESS AND CIRCULATION IN VIRGINIA

The FWS has primary responsibility for providing access and circulation to and within Assateague Island in Virginia, including the seashore's Virginia District facilities. NPS management responsibilities for the transportation system in Virginia include management of in the public road from the Toms Cove Visitor Center to the beach, parking areas, pedestrian trails in the Toms Cove area, and maintenance of the two bridges over the channel between Chincoteague and Assateague Islands. NPS also assists with OSV use management.

- **Assateague Channel Bridges**

The NPS acquired the Assateague Channel Bridge in 1966, as directed by the seashore's enabling legislation. The original bridge, erected in 1962, was acquired from the Chincoteague-Assateague Bridge and Beach Authority along with its other interests on

Assateague Island. The steel truss bridge was replaced by the current Assateague Channel and Sheepshead Creek bridges in 1979. Since then the two bridges have been inspected annually, and have received routine maintenance and periodic repairs on an as needed basis. Most recently, the abutments were reinforced and the support pilings covered with protective collars to extend the lifespan of the bridges. An ongoing project will replace portions of the concrete decking on the Sheepshead Creek Bridge damaged by exposure to salt water during high tides. Within the next five years, if funding is available, it is hoped that the entire span will be replaced and the overall bridge elevated to prevent future water damage. Bridge inspections, maintenance and repairs are funded through the US DOT's Federal Lands and Highways Program.

- **Toms Cove Recreational Beach Access and Parking**

Four parking areas with a crushed shell surface provide a minimum of 961 spaces for day-use visitors at Toms Cove Recreational Beach. Capacity is sufficient for most days of the year, although demand occasionally exceeds capacity on peak summer days, resulting in temporary closures lasting from 30 minutes to four hours, typically between the hours of 11:00 AM and 3:00 PM. In 2009, CNWR reported thirteen closures due to parking areas reaching capacity.

Maintenance of the beach parking areas is a major activity supported by NPS operations funds as well as, in part, by CNWR entrance fees. The lots require routine maintenance twice weekly from April through November and weekly from December through March. Maintenance generally consists of removing wind-blown or over-washed beach sand, filling washouts, smoothing washboard in the parking areas and on the access road, and adding and leveling crushed shell.

Located on a narrow strip of sand adjoining the beach, the parking areas are frequently overwashed during coastal storms (table 3.10). Damage from erosion and sand deposition results in closures until repairs can be completed. Time needed for storm repairs has varied from two weeks to three months. Repairs have ranged from fixing washed-out parking areas and road to total relocation of parking lots and roads to the west.

In response to repeated storm damage at Toms Cove, since 2000 the NPS has implemented a new management strategy, shifting from permanent facilities that can be damaged by storms to temporary facilities that can be removed to a safe location on the mainland in advance of storms.

- **Access to Former Assateague Beach U.S. Coast Guard Station.**

Public access to the former coast guard station occurs primarily by boat. Coastal storms and moving sand have destroyed the one-lane asphalt road previously used for access by the public and staff. OSV access is possible at times, but is subject to periodic long-term closures to protect piping plover (*Charadrius melodus*) habitat. NPS offers kayak tours from Toms Cove that include a stop at the site.

**Table 3.10 Storm Damage to Toms Cove Recreational Beach Facilities (1991 through 2011)**

| Storm Date | Type of Storm | Storm Effects | Repair Costs |
|---|---|---|---|
| October 31, 1991 | northeaster | • extensive damage to facilities and infrastructures | >$1.2 million |
| January 4, 1992 | northeaster | • extensive damage to facilities and infrastructures | (included in above) |
| September 25, 1992 | northeaster | • shoreline erosion and damage to artificial dunes | no records |
| December 10, 1992 | northeaster | • shoreline erosion and damage to artificial dunes | no records |
| August 31, 1993 | Hurricane Emily | • shoreline erosion and damage to artificial dunes | no records |
| March 2-3, 1994 | northeaster | • artificial dunes breached in several locations | no records |
| September 22, 1995 | coastal storm | • shoreline erosion and damage to artificial dunes | no records |
| November 18, 1995 | Hurricane Gordon | • shoreline erosion and damage to artificial dunes | no records |
| September 4, 1996 | Hurricane Eduardo | • shoreline erosion and damage to artificial dunes | no records |
| October 8, 1996 | Tropical Storm Josephine | • shoreline erosion and damage to artificial dunes | no records |
| January 27, 1998 | northeaster | • extensive damage to facilities and infrastructures | >$1.0 million |
| February 5, 1998 | northeaster | • extensive damage to facilities and infrastructures | (included in above) |
| August 26, 1999 | Hurricane Dennis | • shoreline erosion and damage to artificial dunes | no records |
| September 18, 1999 | Hurricane Floyd | • shoreline erosion and damage to artificial dunes | no records |
| January 15, 2003 | northeaster | • shoreline erosion and damage to artificial dunes | $157,700 |
| September 18, 2003 | Hurricane Isabel | • extensive damage to facilities and infrastructures | $477,400 |
| August 24, 2006 | Hurricane Ernesto | • shoreline erosion and damage to artificial dunes | $746,200 |
| October 6, 2006 | coastal storm | • shoreline erosion and damage to artificial dunes | (included in above) |
| September 6, 2008 | Hurricane Hanna | • shoreline erosion and damage to artificial dunes | $196,900 |
| November 12, 2009 | Hurricane Ida | • damage to facilities and parking infrastructure | $343,800 |
| August 27, 2010 | Hurricane Irene | • damage to facilities and parking infrastructure | $724,100 |
| October 29, 2012 | Hurricane Sandy | • damage to facilities and parking infrastructure | $1,286,000 |

## 3.13 Visitor Use and Visitor Experience

### 3.13.1 VISITOR USE

- **Visitation and Visitor Profile**

**Annual Visitation**. During the first two decades of Assateague Island National Seashore – from 1967 to 1987 – the number of visitors to the seashore grew rapidly from 0.7 million to a peak of 2.3 million (table 3.11). The seashore then experienced a 13-year decline in visitation during which the number of people visiting dropped by 30 percent to a low of 1.8 million in 2000. Since 2000 visitation has again grown and currently hovers around 2.0 to 2.2 million annually. Approximately 60 percent of visitation occurs at the Toms Cove area in Virginia and 40 percent of the visitation occurs in Maryland.

**Seasonal Visitation**. Summer and early fall is the time of year when the most people visit the seashore (table 3.12). Approximately two-thirds (68%) of the visitation occurs in June, July, August, and September. July and August are busiest, with 20 to 23 percent of the visitors experiencing the seashore during the warmest summer months. The quietest time at the seashore occurs during the months of December through February.

**Visitor Profile, Group Size and Length of Stay**. A visitor survey conducted at the seashore in the summer of 2006 provides information regarding visitor demographics, motivations, expectations, interests, and needs (Eppley Institute 2007). Following is a summary of findings based on the responses received (Eppley Institute 2007):

- 74 percent of visitor groups were families with an average group size of five people. The average age was approximately 46-years-old. Over 97 percent identified their race as white.
- Approximately 56 percent of the respondents reported either a bachelor's degree or graduate degree. An additional 26 percent of respondents had completed at least some college coursework.
- 77 percent of the visitors had visited the seashore at least once before. 11 percent were local visitors, 87 percent were not local, and 1.5 percent were international.
- 49 percent of the respondents purchased a weekly pass. 27 percent reported having an annual pass, while 24 percent reported purchasing no pass.
- 80 percent of the respondents planned to see horses during their visit. 79 percent also planned to visit the beach.
- 52 percent of respondents indicated their primary reason for visiting the area was to visit Assateague. 18 percent indicated Ocean City, Maryland was the primary reason for their visit to the area.
- Over 60 percent of the respondents indicated that they visited the seashore more than one day on their most recent trip. Of those who did not visit more than one day, the average length of stay was approximately ½ day. For those who did visit more than one day, the average number of days visited was 4.6.

Assateague Island National Seashore
**Fundamental Values – Visitor Experiences at the Seashore**

The natural resources of the seashore provide visitors with a wide variety of active and passive recreational and educational opportunities. Expansive seascapes of ocean and bay, panoramic views, natural sounds, inviting waters, ocean breezes, and dark night skies provide a dramatic setting for an exceptional seashore experience. Visitors have the opportunity to experience the seashore in a variety of ways from walking on the beach to counting the stars by a camp fire, and from ranger guided educational activities to self-guided explorations.

**Table 3.11**

Assateague Island National Seashore
**Total Visitation**
(1967-2014)

| Year | Total Visits |
|---|---|
| 1967 | 738,700 |
| 1970 | 1,648,100 |
| 1975 | 1,885,800 |
| 1980 | 1,967,525 |
| 1985 | 2,304,906 |
| 1990 | 2,050,593 |
| 1995 | 1,928,397 |
| 2000 | 1,810,501 |
| 2001 | 1,897,634 |
| 2002 | 2,117,458 |
| 2003 | 2,020,666 |
| 2004 | 2,048,789 |
| 2005 | 1,996,502 |
| 2006 | 1,932,817 |
| 2007 | 2,110,918 |
| 2008 | 2,011,438 |
| 2009 | 2,129,658 |
| 2010 | 2,106,090 |
| 2011 | 2,105,419 |
| 2012 | 2,154,859 |
| 2013 | 2,056,828 |
| 2014 | 2,170,681 |

*Source: NPS 2015b*

**Table 3.12 Assateague Island National Seashore – Visitor Use Statistics (2000 – 2014)**

| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Main Visitor Center** | 261,738 | 258,652 | 243,929 | 203,371 | 214,115 | 243,674 | 267,631 | 272,851 | 272,164 | 283,226 | 256,252 | 214,478 | 236,278 | 228,545 | 142,314 |
| **Toms Cove Visitor Center** | 80,730 | 104,082 | 135,509 | 134,771 | 122,742 | 108,816 | 85,007 | 71,603 | 57,368 | 70,989 | 79,156 | 60,268 | 85,793 | 65,593 | 68,502 |
| **Bus Visitors** | 30,330 | 30,060 | 28,890 | 25,830 | 22,680 | 24,120 | 54,990 | 55,665 | 84,690 | 48,330 | 44,460 | 55,710 | 45,360 | 44,460 | 46,395 |
| **Oversand Vehicles** | 79,001 | 78,984 | 58,308 | 51,104 | 53,687 | 53,899 | 39,811 | 35,115 | 38,903 | 44,198 | 44,248 | 51,981 | 36,856 | 34,391 | 48,170 |
| **Horseback Riders** | 6,659 | 5,224 | 598 | 385 | 621 | 1,778 | 2,658 | 2,974 | 3,042 | 2,713 | 3,232 | 3,522 | 4,457 | 3,725 | 3,893 |
| **Tent Campers** | 52,629 | 59,280 | 52,354 | 49,379 | 60,476 | 80,738 | 54,882 | 52,742 | 49,114 | 51,779 | 39,523 | 35,928 | 39,185 | 35,782 | 38,428 |
| **RV Campers** | 17,958 | 19,881 | 18,968 | 17,579 | 22,204 | 21,171 | 22,098 | 22,009 | 20,121 | 23,404 | 23,228 | 22,130 | 22,878 | 17,986 | 21,515 |
| **Backcountry Campers** | 2,241 | 2,609 | 3,005 | 2,048 | 2,681 | 2,014 | 2,101 | 2,125 | 1,991 | 2,063 | 2,249 | 2,100 | 4,299 | 1,584 | 2,034 |
| **Miscellaneous Campers** | 14,221 | 13,603 | 13,143 | 10,254 | 11,037 | 12,338 | 16,495 | 26,546 | 24,329 | 35,435 | 17,461 | 14,550 | 14,618 | 15,142 | 15,915 |
| **Visitors on Commercial Vessels** | Na | Na | Na | Na | Na | Na | Na | Na | 31,368 | 30,795 | 31,075 | 28,006 | 23,101 | 26,865 | 29,605 |

*Source: NPS 2015b*

### 3.13.2 VISITOR ACTIVITIES AND RELATED FACILITIES

- **Beachcombing, Swimming and Surfing**

Assateague Island's 37 miles of beaches are some of the East Coast's most beautiful beaches, drawing visitors from throughout the country and the world who enjoy beachcombing, swimming, surfing, and sunbathing. Going to the beach and all the activities associated with a day at the beach is the experience that 80 percent of visitors report as a primary reason for their visit to the seashore (Eppley Institute 2007). Beaches throughout the seashore are open for public use, except for periodic closures of certain areas during the breeding season for protected species, such as Piping Plover. Closures vary from year-to-year depending upon where breeding activity occurs. During the summer, lifeguard-protected beaches are provided at Toms Cove in Virginia and at North Beach in Maryland; nearby parking for South Ocean Beach (MD), North Ocean Beach (MD), and the Toms Cove Beach (VA) enables relatively easy access for visitors to the beach.[1] At each day-use parking area there is a bathhouse with rinse-off showers, changing stalls, toilets, and drinking water. On many summer afternoons, particularly on weekends, demand for parking at the beach exceeds capacity. Experiencing remote beaches on the island is possible by hiking or by oversand vehicle within designated OSV use areas in Maryland and Virginia (see Driving on the Beach).

[1] *Additional lifeguard-protected beach facilities are available at Assateague State Park which is owned and operated by MD DNR.*

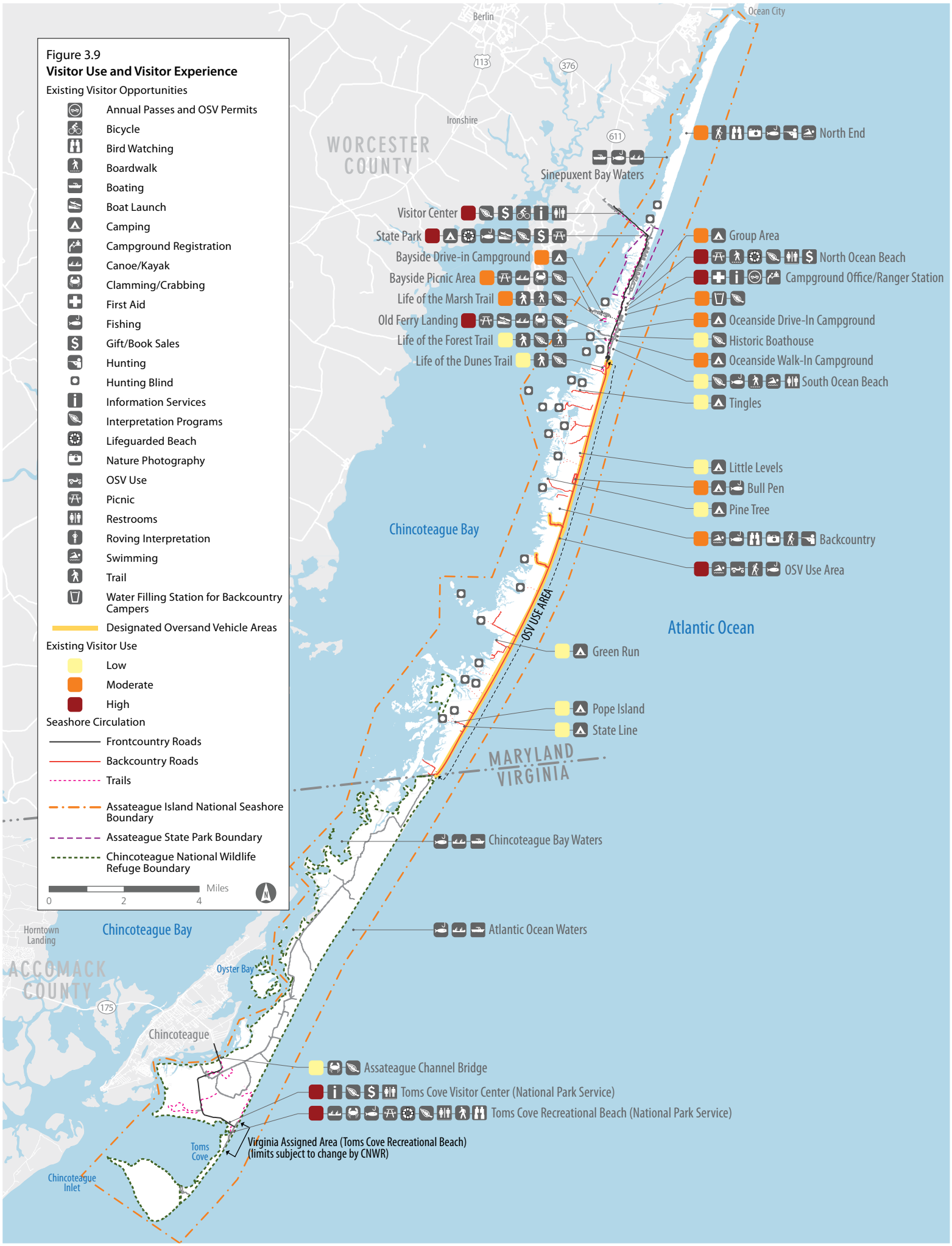


Figure 3.9
Visitor Use and Visitor Experience
Existing Visitor Opportunities
Annual Passes and OSV Permits
Bicycle
Bird Watching
Boardwalk
Boating
Boat Launch
Camping
Campground Registration
Canoe/Kayak
Clamming/Crabbing
First Aid
Fishing
Gift/Book Sales
Hunting
Hunting Blind
Information Services
Interpretation Programs
Lifeguarded Beach
Nature Photography
OSV Use
Picnic
Restrooms
Roving Interpretation
Swimming
Trail
Water Filling Station for Backcountry Campers
Designated Oversand Vehicle Areas
Existing Visitor Use
Low
Moderate
High
Seashore Circulation
Frontcountry Roads
Backcountry Roads
Trails
Assateague Island National Seashore Boundary
Assateague State Park Boundary
Chincoteague National Wildlife Refuge Boundary
Miles
0
2
4
Berlin
Ocean City
113
376
Ironshire
WORCESTER COUNTY
611
North End
Sinepuxent Bay Waters
Visitor Center
State Park
Bayside Drive-in Campground
Bayside Picnic Area
Life of the Marsh Trail
Old Ferry Landing
Life of the Forest Trail
Life of the Dunes Trail
Group Area
North Ocean Beach
Campground Office/Ranger Station
Oceanside Drive-In Campground
Historic Boathouse
Oceanside Walk-In Campground
South Ocean Beach
Tingles
Little Levels
Bull Pen
Pine Tree
Backcountry
OSV Use Area
Chincoteague Bay
OSV USE AREA
Atlantic Ocean
Green Run
Pope Island
State Line
MARYLAND
VIRGINIA
Chincoteague Bay Waters
Atlantic Ocean Waters
Horntown Landing
Chincoteague Bay
ACCOMACK COUNTY
Oyster Bay
175
Chincoteague
Assateague Channel Bridge
Toms Cove Visitor Center (National Park Service)
Toms Cove Recreational Beach (National Park Service)
Virginia Assigned Area (Toms Cove Recreational Beach)
(limits subject to change by CNWR)
Toms Cove
Chincoteague Inlet

Assateague Island National Seashore
**Other Important Resources – Horses**

Horses have been present on Assateague Island for hundreds of years. The seashore provides a unique opportunity to view wild horses in a natural setting, and a majority of visitors indicate that seeing horses is one of the primary reasons for visiting Assateague Island.

- **Viewing Horses**

Assateague Island's wild horses attract thousands of visits to the seashore. Seeing horses is the experience that 80 percent of visitors report as a primary reason for their visit (Eppley Institute 2007). Two herds of horses live on Assateague Island, separated by a fence at the boundary between Maryland and Virginia. The horses have a well-developed social structure and are organized into bands of two to twelve animals, each band occupying a home range generally within the island's marshes close to their best food sources. In Maryland, the horses roam freely and are often seen around roads and campgrounds and from the Life of the Forest and Life of the Marsh Trails. In Virginia, they are seen in Black Duck Marsh from observation platforms along Beach Road and the Woodland Trail.

The NPS owns the Maryland herd which it manages to protect long-term herd health and viability, to protect characteristics such as their free-roaming nature, and to protect the seashore's habitat health and ecosystem function (NPS 2008a). The Chincoteague Volunteer Fire Company owns and manages the Virginia herd, which is allowed to graze on Chincoteague National Wildlife Refuge through a permit issued by the FWS. Each year, horses from the Virginia herd are rounded up and foals are sold at the Pony Penning and Auction held in late July – an event that draws thousands of visitors to the town of Chincoteague and the seashore.

- **Driving on the Beach**

Oversand vehicle enthusiasts and other beach goers can access approximately 15 miles of the seashore's beaches within the designated OSV use area in Maryland and Virginia. In recent years anywhere from about 30,000 to 50,000 visitors have explored the seashore's beaches and enjoyed beach recreation activities by driving on the beach. In general, approximately 23 percent of OSV users are interested in surf fishing and 10 percent are interested in going to the beach to swim or surf (Eppley Institute 2008). Most OSV users spend many days each year at the beach with two-thirds visiting more than ten times; 13 percent visit more than 50 times a year (Eppley Institute 2008). The OSV use area encompasses the beach area below the winter storm berm and east of a designated line marked by black and white posts. Vehicles must stay on marked oversand vehicle routes. All sand dunes and vegetated areas are closed, even those within a designated OSV use area. Partial or total closure of the OSV use area to all vehicle, boat, and pedestrian use can occur during the nesting season for protected species – particularly the piping plover (*Charadrius melodus*). Permits are required for all vehicles. The number of vehicles allowed at any one time within the OSV use area is limited to 145 in Maryland and 48 in Virginia (18 when Toms Cove hook area is closed due to bird nesting). When these limits are reached a closure becomes effective, and vehicle access is managed on a one off/one on basis. In Virginia, visitors with a valid overnight fishing permit can remain after hours. In Maryland, overnight parking on the beach is prohibited except for those who are actively engaged in fishing. Sleeping is strictly prohibited. Self-contained vehicles are allowed to park overnight within a

designated area (known as the Bull Pen) if they are equipped with an approved toilet and permanently installed waste storage tank capable of holding two days volume of waste for each person remaining in the area overnight.

- **Camping at the Beach**

Seashore camping at Assateague has been the focus of a family vacation experience for many visitors since the seashore was established. Approximately 15 percent of visitors indicated that they planned to camp during their visit (Eppley Institute 2007). Annually for the past ten years an average of approximately 82,000 visitors camped at NPS campgrounds, of which 72 percent camped in tents and 28 percent camped in recreational vehicles. NPS operates campgrounds in Maryland at Bayside and Oceanside, with some sites available year-round.[1] Oceanside offers approximately 40 drive-in sites for tents, trailers, and recreational vehicles (no hookups) and approximately 60 walk-in sites located 100 to 200 feet from centralized parking areas; each site has a picnic table and an upright grill. Bayside offers approximately 50 drive-in sites for tents, trailers, and recreational vehicles (no hookups); each site has a picnic table and ground fire grill. Other camping facilities are "primitive," including toilets, cold water showers, and drinking water. Organized clubs and affiliated groups are able to use the five group campsites at Oceanside. Group campsites are designed for tent-only use and are walk-in, with a centralized parking area located 100 to 200 feet from each campsite. A reservation system is in place for all campsites from April 15$^{th}$ through October 15$^{th}$. During summer months the campgrounds are typically full every night.

- **Backcountry Camping**

Backcountry camping is popular with some visitors who want to explore the seashore by foot, canoe, or kayak, and who seek a more primitive experience. October through March – when biting insects are less bothersome – is the preferred time of year for backcountry exploration. Campsites include two oceanside sites in the open dunes that are open year-round and four bayside sites set among pine forests that are open year-round, except for a brief period in the fall during hunting season. Backcountry camping is not permitted outside these sites. Each campsite has a chemical toilet and picnic table but no drinking water. Bayside sites also each have a fire ring. Distance to the backcountry sites from the Sinepuxent Ranger Station in Maryland is 2.5 to 13 miles; from the Toms Cove Visitor Center in Virginia the distance is 12.5 to 22.5 miles. On average 2,500 visitors have camped at backcountry campsites annually over the past ten years (NPS 2013b). Pine Tree is most popular with backcountry users.

- **Fishing**

Public fishing within the seashore boundaries is recognized as an appropriate recreational activity and is authorized in the legislation that established the seashore

[1] *Additional camping facilities are available at Assateague State Park which is owned and operated by MD DNR.*

(Public Law 89-195) (appendix A). Assateague Island offers some of the best surf fishing on the Mid-Atlantic coast and because large stretches of beach can be accessed by car, it is very popular with anglers. Many popular gamefish occur in the waters near the island, including croaker, bluefish, sea trout, and drum. Anglers can fish from all of the seashore beaches that are not lifeguarded beaches. Overnight fishing is permitted. While fishing takes place during all times of the year, the best seasons are late spring, early summer, and early fall. Flounder fishing is usually good from April through October. Fishing the back bays of the island is also popular.

- **Shellfishing and Shell Collecting**

The back bays of Assateague Island offer some of the best opportunities for recreational shellfishing along the coast of Maryland and Virginia. Many local areas of the seashore are subject to light shellfishing pressure. The most accessible and popular areas are accessed from the Old Ferry Landing and the Bayside Drive Picnic Area, where a concession offers standard clam rakes for rent. Many visitors discover other areas of the back bays as they wade the shallow waters crabbing, raking for clams, and searching for mussels. Clamming requires visitors to wade further to reach outlying areas where clams are more abundant. In contrast, mussels are more easily reached at the edges of most saltmarshes. Crabs are generally ubiquitous. Some crabbers also fish from small boats, exploring the back bays more widely. Dockside crabbing takes place at Old Ferry Landing and on the mainland at the state park crabbing dock and the South Point boat ramp. Crabbing is not permitted from the Assateague Bridge and Sheepshead Bridge in Virginia or the Verrazano Bridge in Maryland.

Shelling is also very popular among seashore visitors. 33 percent of visitors indicated that they planned to look for seashells on their trip (Eppley Institute 2007). The most productive beaches for shelling are on the southern tip of Toms Cove Hook in Virginia or at the north end in Maryland. After a storm is the best time for shelling.

- **Hiking**

In Maryland, one-half mile self-guiding loop walks are available on the Life of the Marsh, Life of the Forest, and Life of the Dunes Trails. Hikers can also enjoy miles of undisturbed beach hiking. Visitors can hike north to the Ocean City Inlet at the north end or south within the OSV use area. Those hiking to backcountry campsites walk on the beach, crossing the dunes by way of designated routes to campsites.

- **Bicycling**

In Maryland, cyclists can use 4.6 miles of paved bike path beginning at the visitor center on the mainland, crossing the Verrazano Pedestrian Bridge, and continuing on the paved bike path along Bayberry Drive and Oceanside Campground. Summer bike rentals are available at Bayside Drive. In Virginia about half of the refuge trails are paved for bicyclists. A bike path leads from the town of Chincoteague to the refuge with routes to the Refuge Visitor Center and the Toms Cove Visitor Center.

- **Birding**

Assateague Island is one of the finest places for birding on the East Coast, attracting many visitors particularly during the spring and winter months. Approximately 20 percent of visitors to the seashore say that birding is one of the reasons for their visit (Eppley Institute 2007). Spring is a good time to see large number of migrating shore birds, song birds, and other transient species. In the summer the marshes along the back bays host a variety of herons, egrets, and other wading birds. Late summer brings migrating shorebirds and peregrine falcons to the island. Thousands of water fowl winter at the seashore. While birding is possible on foot and by vehicle, many bird watchers travel by private boat in the back bays or more frequently as part of a commercial tour.

- **Boating**

The protected waters of Chincoteague and Sinepuxent Bays within the seashore are ideal for boating. In Maryland, the Bayside and Old Ferry Landing areas are the focal points for canoeing and kayaking, offering access to the back bays for visitors who bring their own boats and providing canoe, kayak, and paddle board rentals for others. Water trail maps are available that guide visitors interested in exploring the coastal bay and saltmarsh flats around Little Egging Island near Bayside and Old Ferry Landing. Guided canoe trips also leave from Bayside. Paddlers can explore the back bays in Maryland, departing from Bayside or Old Ferry Landing on the island or from mainland access sites at Ocean City Harbor, Assateague State Park, or Public Landing. Multi-day trips are possible by using the four canoe-in backcountry campsites which are marked by signs located on the marsh edge. Many visitors travel by power boat from Ocean City to the island, landing at the north end where they picnic and enjoy the beach. Power boats can be rented in Chincoteague or Ocean City.

- **Horseback Riding**

In recent years approximately 2,000 to 3,500 horseback riders annually have enjoyed riding on the seashore's beaches in Maryland and Virginia (NPS 2013b). Horseback riding is permitted on the beach in Maryland within the oversand vehicle (OSV) use area each year from October 9$^{th}$ through May 14$^{th}$. During other periods riding is not permitted due to the presence of biting insects known to spread disease, such as equine infectious anemia. Riders check in and park at the North Beach Ranger Station. Horses must be led to the top of the dune, where riders can then mount and ride south on the beach. Riders can use the 1.5 mile stretch of beach between the ranger station and the beginning of the OSV use area only as a corridor for entrance and exit. Horse camping is permitted early-October through mid-May within a designated horse camping area.

In Virginia, horseback riding is permitted on the beach within the OSV use area at all times of the year, except during migratory bird nesting periods when the OSV use area is subject to closures. Horse trailers park within a designated parking lot.

- **Hunting**

Public hunting within the seashore boundaries is recognized as an appropriate recreational activity and is authorized in the legislation that established the seashore (Public Law 89-195) (appendix A). The regulations for hunting within the seashore are designed to provide a meaningful and safe experience for hunters. State laws governing hunting on public lands in Maryland and federal regulations (Title 36 CFR) apply to both the lands and the waters within the seashore boundaries. Hunting is legal only in specifically designated areas of the seashore. Hunting seasons and regulations are in place for deer (white-tailed deer (*Odocoileus virginianus*) and sika deer (*Cervus nippon*)); upland game and furbearers (fox); webless migratory birds (doves); and waterfowl (ducks, coots, mergansers, sea ducks, geese, and brant). Hunting for squirrels is prohibited due to the potential presence of the endangered Delmarva Peninsula fox squirrel (*Sciurus nigra cinereus*).

Areas open for hunting north of Assateague State Park are accessible by boat and foot only. Areas open for hunting south of the Maryland developed area are generally accessible by walking from the OSV use area or by walking from the Life of the Dunes Trail (creating a conflict between visitors walking on the trail and hunters carrying guns). Within this area access is also permitted by vehicle to one backcountry campsite during hunting season for deer. Waterfowl hunting occurs from a network of permanent blinds, portable blinds placed in designated sites, and anchored boats.

**Table 3.13**

Assateague Island National Seashore
**Accessible Facilities**

**Administrative Offices**
- Seashore Headquarters Complex
- Sinepuxent District Ranger Station

**Visitor Centers**
- Assateague Island Visitor Center
- Toms Cove Visitor Center

**Parking Facilities**
- all parking areas at developed seashore facilities

**Restrooms**
- all comfort stations at developed park facilities
- portable toilets at Toms Cove Beach

**Beach Access**
- boardwalk to North Beach from the parking area

**Developed Campgrounds**
- one accessible site at Oceanside Campground
- one accessible site at Bayside Campground

**Developed Picnic Facilities**
- hardened surface, accessible picnic tables, and accessible grills available at developed picnic facilities

**Trails**
- Life of the Marsh Trail
- Life of the Forest Trail

**Hunting Facilities and Program**
- North End hunting site

### 3.13.3 OPPORTUNITIES FOR VISITORS WITH DISABILITIES

The NPS is committed to implementing all practicable efforts to make NPS facilities, programs, services, employment, and meaningful work opportunities accessible and usable by all people, including those with disabilities. Accordingly, most administrative offices, some camping facilities, and most interpretive and visitor service facilities are accessible (NPS 2006c). Undeveloped areas, such as those outside the immediate influence of buildings and roads, will not normally be modified (NPS 2006c).

In accordance with NPS policy, the seashore has made numerous improvements to seashore facilities in recent years to enhance accessibility. Today most developed visitor facilities are generally accessible to visitors and employees with disabilities (table 3.13). Of primary interest to disabled visitors is access to the beach. A boardwalk provides access to the North Ocean Beach; although visitors report that the long distance to the beach from the parking area makes it difficult to get to the beach and once there it is impossible to maneuver a wheelchair on the sand (Eppley Institute 2007). Beach-compatible wheelchairs are available on a first-come first-served basis free-of-charge at North Beach and Toms Cove recreational beaches. In recent years the seashore has made available a deer hunt in the developed area for persons with disabilities. Interpretive programs offered at visitor contact facilities and some other facilities are wheelchair accessible.

### 3.13.4 COMMERCIAL SERVICES, SPECIAL USES, AND TOURS

- **Commercial Services**

In July of 2014 a 10 year concessions contract was awarded to Maryland Coastal Bays Program/SuperFun Ecotours Joint Venture, trading as Assateague Outfitters. The managing partners are the executive director of Maryland Coastal Bays Program (a local non-profit organization) and the two owners of SuperFun Ecotours. In its first season of operation, the concessioner served 16,468 visitors at its two locations within the Maryland developed area.

The Kayak Shed at the bayside day use area provides rental kayaks/canoes, paddleboards, bicycles, and clam rakes; kayak tours; and retail items, such as camping supplies, snacks, firewood, bait and ice. The bayside location served 7,783 visitors in 2014.

The Beach Hut at north beach day use area served 8,685 visitors in 2014. The Beach Hut is a small retail outlet primarily for beach goers that provides items such as snacks, gifts, educational materials, beach and camping supplies, firewood, ice, and beach chair rentals.

The Assateague State Park also has a concessioner providing gifts, snacks and prepared foods.

In 2014 there were 39 out-of-park commercial use authorizations operating to provide commercial services to visitors in the Park, such as guided kayak tours, boat tours, and waterfowl hunting. Ten of these were issued to new service providers in 2014, and ten expired permits were reissued in 2014. A total of 2,657 packages were provided to 50,167 people in Maryland and in the waters around the island in Virginia in 2014.

- **Special Uses**

In 2014 the Park issued 4,945 Oversand Vehicle Permits for use in MD and an additional 315 permits for use only in Virginia, for a total of 5,260 permits.

In 2014 there were 238 waterfowl hunting permits issued for use in Maryland, and 368 permitted deer hunters signed in, including 18 for a special hunt for persons with disabilities. Only 2 permitted upland game hunters signed in.

Another 60 special use permits were issued in 2014 for a variety of uses, including special events, such as beach parties/bonfires, weddings, fishing tournaments and the AMSA Camporee.

### 3.13.5 VISITOR ORIENTATION, INTERPRETATION, AND EDUCATION

- **Pre-Visit Information and Orientation**

Visitors planning their first trip to the seashore primarily rely on information obtained from friends and relatives who have been to Assateague Island, travel guides, tour

books, and the internet (Eppley Institute 2007). Other sources of information used less frequently include tourist information centers outside the seashore, pre-visit calls to the seashore office, media, newspapers, county visitors bureaus, and school programs (Eppley Institute 2007). The seashore website, used by approximately 19 percent of visitors in advance of a trip, provides directions to the seashore and includes a variety of information useful for trip planning, such as seashore activities, interpretive programs, downloadable maps and brochures, rules and regulations, and general seashore management news.

- **On-Site information and orientation**

**Visitor Contact Facilities.** Seashore staff manages three visitor contact facilities. Each is open year-round. The Assateague Island Visitor Center is the seashore's primary visitor center, located on MD Route 611 on the mainland side of the Verrazano Bridge entrance. The Maryland District Ranger Station/Campground Office, located on the island immediately beyond the entrance station, is the primary contact station for campers, hunters, backcountry travelers, and OSV users. In Virginia, the Toms Cove Visitor Center, adjoining the beach parking area, provides information, and interagency passes to beachgoers and others.

**Park Publications.** Most visitors to the seashore rely on the official map and guide for basic information on attractions, recreational opportunities, and travel directions. Special topic brochures address resource concerns such as wild horse viewing safety, OSV use, camping, backcountry use, horseback riding, hunting, swimming safety, and other subjects.

**Information Boards.** Information boards located at attractions and facilities throughout the seashore provide site-specific orientation, safety information, rules and regulations, information on activities and events, and interpretive information.

**Signage.** The NPS, state transportation agencies, and the FWS cooperate to provide signage on regional roadways and on local roads that provide access to the seashore entrance in Maryland and in Virginia.

- **Interpretive Media**

**Visitor Center Exhibits.** The Assateague Island Visitor Center and the Toms Cove Visitor Center include exhibits, a touch tank, and marine aquariums. A film about the wild horses of the island is shown at the Assateague Island Visitor Center, which also offers expanded exhibits describing barrier island dynamics, island ecology, and cultural history.

**Wayside Exhibits.** Wayside exhibits are in place at trail heads, along trails, at visitor centers, at beach access sites, some cultural resource sites, and elsewhere in the seashore.

**Publications.** A variety of publications provide interpretive information for natural resource areas and cultural resources. Brochures include wildlife viewing, horse brochures, nature trail guides, resource protection, surf fishing, crabbing and clamming, local area brochures, and activity publications.

- **Interpretive Programs**

**Walks and Talks**. Ranger-guided programs are held throughout the year, with an emphasis on summer interpretive and recreational opportunities. Programs are publicized on the seashore website, social media, at visitor contact facilities, and on information boards. Full immersion programs such as kayaking, bay seining, crabbing, and surf fishing programs can be found in both the Maryland and Virginia districts. Beach and marsh walks, children's programs, campfire programs, and bird walks are also popular. During July and August 2014, almost 14,490 visitors received on-site ranger-led programs, with the popular aquarium talks reaching approximately 2,600 people.

**Informal Contacts (Roving Rangers).** Roving interpretation occurs throughout the developed area in Maryland and in Virginia along the Toms Cove lifeguarded beach, parking lot closure areas, and on some refuge trails. These are excellent opportunities to increase visitor understanding and appreciation of the seashore. In 2014 rangers, volunteers, and Coastal Stewards (a youth group) provided informal interpretive experiences for approximately 24,700 visitors.

**Junior Ranger Program**. The Junior Ranger Program is available for families who visit the seashore. The booklets can be picked up at any seashore contact facility and provide youngsters ages 6 and up an enjoyable and meaningful way to explore the resources and history of the seashore. Upon completion of the program, Junior Rangers receive a certificate and patch. In 2014 approximately 1,800 young people participated in this program.

**Discovery Trailer.** The Discovery Trailer enables seashore staff to create mobile events for schools, special request programs, and events. The trailer can transport all the equipment needed for activities and programs. The Discovery Trailer is covered with an Assateague mural designed by local children and makes a great backdrop for marine life exhibits and programs. It can be seen at Junior Ranger activities, Maryland Coast Day, and similar events.

**Special Request Out-of-Seashore Programs.** Special requests for off-site programming fall into several categories. Rangers can be called upon to speak on resource topics for special interest groups such as garden clubs, Kiwanis, boat clubs, and others. They can be requested to present at workshops, and along with volunteers and Coastal Stewards represent the NPS at local events.

- **Educational Programs**

Assateague Island National Seashore provides curriculum-based education programs meant to enhance classroom instruction and support Maryland and Virginia Standards

of Learning. Educational opportunities are also provided for adult life-long learners. Programs employ classroom activities as well as hands-on, sensory-based activities and encourage problem-solving and critical thinking. They convey stewardship concepts and the mission of the NPS. Programs take place on the island and in local communities.

**Curriculum-based Educational Program**. The seashore has worked with local schools since 1986 to present curriculum-based educational programming for pre K through 12th grade students. In Maryland, environmental literacy courses are now required as part of the educational experience. Experiential activities include beach explorations, marsh and bay studies, and laboratory exercises. The new Climate Change and Coastal Bays Program (CCCB) engages high school students with hands-on immersive learning activities. Field studies enhance student understanding of climate change science, island geomorphology, chemical nutrient cycling, sea level rise modeling, and coastal bays ecology. The majority of curriculum-based education for pre K through 12th grade students takes place in the Maryland District.

**Continuing Education**. Continuing education opportunities at the seashore take many forms. Life-long learners participate in programs offered through outreach, on-site activities and workshops, and as interns and volunteers, take part in authentic field activities alongside NPS staff. Teacher and informal educator workshops are also offered. Groups include Rhodes Scholars, nature clubs, birders, master naturalists, and those interested in barrier island dynamics and climate change.

**Coastal Stewards Program**. The Coastal Stewards Program is a youth partnership program. The Maryland Coastal Bays Program pays a small group of diverse young people from low income neighborhoods to sign up as NPS volunteers to work on and around Assateague. This is a work/education experience designed to provide authentic non-traditional work and education opportunities. Students learn about cultural and natural resource issues, take part in concentrated interpretive training, and provide informal interpretive contacts to the public under the guidance of paid staff. In 2013 the Coast Stewards presented stewardship messages to approximately 21,000 people on the island and during outreach events.

## 3.14 Socio-economic Environment

Adjoining the seashore, the two coastal counties of Worcester County, Maryland, and Accomack County, Virginia, are destinations for millions of visitors annually. Tourism is the region's number one industry, fueled in large part by Ocean City, Maryland's premier Atlantic oceanfront destination, attracting an estimated 10 million visitors each year. Complimenting Ocean City are the natural and cultural resources along the coast of Worcester and Accomack Counties that attract vacationers, fishermen, nature lovers, and others to the area – including Assateague Island National Seashore and the famous Assateague Island "wild ponies". Increasingly, the area is a retirement location for older Americans investing in new permanent homes or in second homes for seasonal use.

### 3.14.1 REGIONAL CONTEXT – WORCESTER AND ACCOMACK COUNTIES

- **Regional Context – Demographic Profile**

In 2010 approximately 84,618 people lived in the two-county coastal area adjoining the seashore (US Bureau of the Census 2011) (table 3.14). Over the past decade, growth continued in Worcester County, Maryland, while Accomack County lost residents. During the 10 years from 2000 to 2010 Accomack County experienced a net loss of 5,141 residents, resulting in a 13.4 percent decline in total population. In contrast approximately 4,911 residents moved into Worcester County during the last decade, resulting in 10.6 percent growth.

**Table 3.14 Housing, Employment, and Income Overview – 2000 and 2010**

| | Worcester County (MD) | Accomack County (VA) | Total |
|---|---|---|---|
| **POPULATION[1]** | | | |
| 2000 | 46,543 | 38,305 | 84,848 |
| 2010 | 51,454 | 33,164 | 84,618 |
| Numerical Change | 4,911 | -5,141 | -230 |
| Percent Change | 10.6% | -13.4% | -2.8% |
| **HOUSING[2]** | | | |
| 2000 Housing Units | 47,360 | 19,550 | 66,910 |
| 2010 Housing Units | 55,749 | 21,002 | 76,751 |
| Numerical Change | 8,389 | 1,452 | 9,841 |
| Percent Change | 17.71% | 7.43% | 14.71% |
| **EMPLOYMENT[2]** (annual not seasonally adjusted labor force) | | | |
| 2000 | 24,468 | 17,482 | 41,950 |
| 2010 | 24,389 | 18,667 | 43,056 |
| Numerical Change | -79 | 1,185 | 1,106 |
| Percent Change | -0.32% | 6.78% | 2.64% |
| **INCOME[1]** | | | |
| Median Household Income | $56,277 | $39,638 | |

*Source:* [1] *U.S. Census Bureau 2011b* [2] *Virginia Department of Labor and Industry*

The two-county population is fairly old – in 2010 the median age in Worcester County was 48. 1 years and in Accomack County was 44.7 years. These median ages considerably exceed the median statewide ages of 38.0 years in Maryland and 37.5 years in Virginia, as well as the national median age of 37.2 years. Despite the older median age, there was a strong base of younger residents; about 26 percent of the two-county's population was under the age of 25. But those over the age of 55 represented 37 percent of all residents, leaving fewer people in the middle of the age profile.

Approximately one-quarter of residents were minorities in 2010. At that time about 75 percent were white, 20 percent were Black or African American, and 5 percent were other races. In 2010, 85 percent of adults over the age of 25 reported having a high

**Table 3.15 Employment by Industry – 2010 Annual Average**

| | Worcester County (MD) | | Accomack County (VA) | | Total |
|---|---|---|---|---|---|
| | Number | % | Number | % | % |
| Total Employment | **22,950** | | **12904** | | |
| **Government – Total** | **3,754** | **16%** | **2,803** | **22%** | **18%** |
| Federal | 262 | 1% | 656 | 5% | 3% |
| State | 372 | 2% | 388 | 3% | 2% |
| Local | 3,120 | 14% | 1,759 | 14% | 14% |
| **Private Sector – Total** | **19,196** | **84%** | **10,099** | **78%** | **82%** |
| Natural Resources and Mining[1] | 70 | 0.3% | 280 | 2% | 1% |
| Construction | 1,065 | 5% | 471 | 4% | 4% |
| Manufacturing | 707 | 3% | 3,202 | 25% | 11% |
| Trade, Transportation and Utilities | 3,988 | 17% | 1,845 | 14% | 16% |
| Information | 114 | 0.5% | 75 | 1% | 1% |
| Financial Activities | 1,106 | 5% | 317 | 2% | 4% |
| Professional and Business Services | 1,133 | 5% | 1,112 | 9% | 6% |
| Education and Health Services | 2,065 | 9% | 1,137 | 9% | 9% |
| Leisure and Hospitality | 8,249 | 36% | 1,320 | 10% | 27% |
| Other Services/ Unclassified | 699 | 3% | 340 | 3% | 3% |

1 *also includes agriculture, fishing and hunting* *Source: MD LLR 2011; VA EC 2012*

school diploma and 23 percent reported also having degrees from four-year colleges. This is comparable to the national average of 85 percent and 28 percent, respectively.

- **Regional Context – Economic Profile**

As of December 2010, the two-county labor force included 35,854 workers, representing about 42 percent of the total population. Approximately 41 percent of the area's jobs were in services, leisure, and hospitality and retail trade. Another 18 percent were in the government sector. In Worcester County the tourism industry is stronger when compared to Accomack County, largely due to Ocean City. In contrast Accomack County has a stronger manufacturing sector, which composes 25 percent of the county's jobs compared to 3 percent in Worcester County. The natural resources sector including agriculture – historically the major industry for both counties – has declined to only 1 percent of total jobs. Household income varies widely between the two-county area. In 2010 Worcester County median income was $56,277 (8 percent over the national average) while in Accomack County median income was $39,638 (24% below the national average). Approximately 10 percent of Worcester County residents and 16 percent of Accomack County residents were living below the poverty level in 2010 (national average = 13.8%).

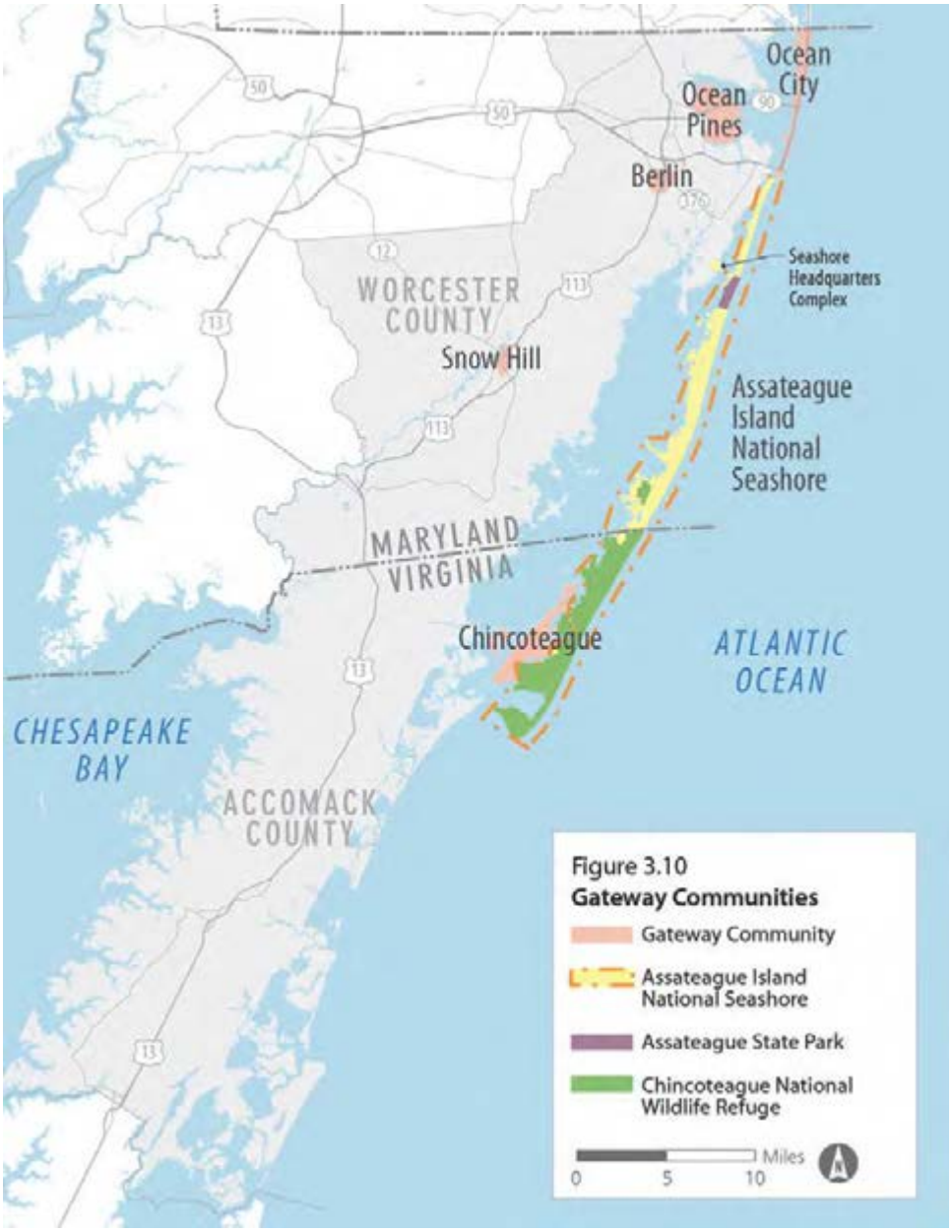
### 3.14.2 GATEWAYS TO THE SEASHORE

Six coastal communities are gateways to the seashore, each with a distinct character and different relationship to the seashore.

- **Berlin, Maryland**

Berlin is a small historic town that is both a designated Main Street Maryland community and an Arts and Entertainment District. The town is recognized for its traditional downtown, its historic architecture, and its locally-owned businesses. Since 2000, Berlin has experienced considerable change due to new residential development that has occurred in areas adjoining the downtown.

From 2000 to 2010 Berlin's population grew by 29 percent (994 new residents) and the number of housing units increased by 37 percent (526 new units). The community is generally a year-round community with relatively few seasonal housing units (only 3.7% in 2010), although there is a high percentage of rental units (41% in 2010). With a median age of 38.4 years (in 2010) Berlin is generally younger and families are generally larger with more children when compared to other gateway communities. Berlin's median household income from 2006 to 2010 of $51,004 was just below the national average of $51,900; during that period approximately 11.6 percent of the population was living below the poverty level. In 2010, 30 percent of the residents were minorities (Black, African American or Other). When compared to the rest of the country, the percentage of high school graduates was above average while the percentage of those who have some education beyond high school was below average.




- **Chincoteague, Virginia**

The town of Chincoteague is a small coastal community that attracts a million or more vacationers annually, many returning year after year to spend their summer holiday as seasonal residents, renters, or campers. Most visitors are drawn to Chincoteague by its small-town character, the fishing history and seafood, the nature-based experiences at Chincoteague National Wildlife Refuge, and the beaches and "wild ponies" of Assateague Island. From 2000 to 2010 Chincoteague's year-round permanent population decreased by 32 percent. Despite the loss of 1,376 residents, an additional 547 new housing units were built in the community during the same period. This marks

**Table 3.16 Gateway Community Population, Housing and Employment Overview – 2000 and 2010**

| | Berlin (MD) | Chincoteague (VA) | Ocean City (MD) | Ocean Pines (MD) | Snow Hill (MD) Total |
|---|---|---|---|---|---|
| **POPULATION[1]** | | | | | |
| 2000 | 3,491 | 4,317 | 7,173 | 10,496 | 2,409 |
| 2010 | 4,485 | 2,941 | 7,102 | 11,710 | 2,103 |
| Numerical Change | 994 | -1,376 | -71 | 1,214 | -306 |
| Percent Change | 28.5% | -31.9% | -1.0% | 11.57% | -12.7% |
| **AGE PROFILE, 2010[1]** | | | | | |
| Under 18 | 1,155 | 454 | 644 | 1,581 | 487 |
| 18-24 | 331 | 178 | 478 | 537 | 167 |
| 24-34 | 561 | 238 | 780 | 793 | 188 |
| 35-44 | 567 | 310 | 699 | 1,002 | 219 |
| 44-55 | 593 | 417 | 1,051 | 1,493 | 316 |
| 56-64 | 483 | 542 | 1,349 | 2,260 | 301 |
| 65+ | 795 | 802 | 2,101 | 4,044 | 425 |
| Median Age | 38.4 | 52.0 | 54.2 | 57.6 | 44.7 |
| **RACE[1]** | | | | | |
| White | 3,219 | 2,884 | 6,641 | 11,201 | 1,237 |
| Black or African American | 1,128 | 44 | 235 | 362 | 860 |
| Other | 291 | 103 | 335 | 295 | 57 |
| **HOUSING UNITS[1]** | | | | | |
| 2000 | 1,427 | 3,970 | 26,317 | 7,083 | 964 |
| 2010 | 1,953 | 4,517 | 30,119 | 8,870 | 1,005 |
| Numerical Change | 526 | 547 | 3,802 | 1,787 | 41 |
| Percent Change | 38.9% | 13.8% | 14.5% | 25.2% | 4.3% |
| **AVERAGE HOUSEHOLD SIZE[1]** | | | | | |
| 2000 | 2.46 | 2.08 | 1.91 | 2.28 | 2.37 |
| 2010 | 2.55 | 2.06 | 1.84 | 2.14 | 2.32 |

**Table 3.16 Gateway Community Population, Housing and Employment Overview – 2000 and 2010**

| | Berlin (MD) | Chincoteague (VA) | Ocean City (MD) | Ocean Pines (MD) | Snow Hill (MD) Total |
|---|---|---|---|---|---|
| **HOUSEHOLD INCOME[1]** | | | | | |
| less than $25,000 | 378 | 594 | 879 | 586 | 344 |
| $25,000 - $49,999 | 371 | 370 | 1,107 | 1,445 | 208 |
| $50,000 - $74,999 | 340 | 185 | 694 | 1,048 | 205 |
| more than $75,000 | 454 | 444 | 1,224 | 2,025 | 203 |
| Median Household Income | $51,004 | $33,109 | $49,000 | $63,370 | $40,313 |
| Persons Living below Poverty Level | 11.6 | 13.4 | 18.1 | 8.3 | 7.6 |
| **HOUSING TENURE[1]** | | | | | |
| Owner-Occupied | 999 | 1,070 | 3,852 | 4,649 | 494 |
| Renter-Occupied | 689 | 347 | 1,216 | 2,084 | 377 |
| Seasonal Units as a % of Total Housing Units | 3.7% | 59.5% | 74.2% | 33.6% | 0.9% |
| **EDUCATIONAL ATTAINMENT[2]** | | | | | |
| Population 25 Years and Older | 2,809 | 2,529 | 6,131 | 9,188 | 1,808 |
| Less than 9th Grade | 6.7% | 6.6% | 1.8% | 0.7% | 5.0% |
| 9th to 12th Grade, no diploma | 8.1% | 10.0% | 6.5% | 3.8% | 13.5% |
| High School Graduate | 37.0% | 37.0% | 27.1% | 28.6% | 41.9% |
| Some College, no degree | 15.8% | 15.1% | 23.7% | 21.3% | 16.2% |
| Associate's Degree | 10.7% | 5.5% | 8.2% | 10.4% | 3.2% |
| Bachelor's Degree | 14.9% | 12.1% | 23.3% | 22.3% | 11.3% |
| Graduate or Professional Degree | 6.8% | 13.7% | 9.5% | 12.9% | 9.0% |

*3 2010National Average Median Income = $51,900*

*4 2010 National Average for Percent Living Under the Poverty Level = 13.8%*

*Source: [1] U.S. Census Bureau 2011b [2] U.S. Census Bureau 2011a*

an increasing trend toward seasonal residences; in 2010, 60 percent of the housing units were seasonal residences and one in four units was a rental. Most new homes were built or purchased by people who live permanently elsewhere, many of whom are older and retired or nearing retirement; some ultimately plan to live permanently in

Chincoteague while many others have purchased units as investment properties which they use part-time and otherwise rent whenever possible. In 2010, the average age was 52 years, much older than the national average of 37.2 years. From 2006 to 2010 Chincoteague's median income was $33,109 – well below the national average of $51,900; during that period approximately 13.4 percent of the population was living below the poverty level. In 2010 only 4 percent of the residents were minorities (Black, African American or Other). When compared to the rest of the country, the percentage of high school graduates was above average while the percentage of those who have some education beyond high school was below average.

- **Ocean City, Maryland**

Ocean City is a year-round resort that attracts 8 million vacationers annually who enjoy its 10 miles of beachfront, three-mile boardwalk, and huge array of lodging facilities, shops, and restaurants. Today Ocean City is a diverse community with a wide variety of residents and visitors. From 2000 to 2010 Ocean City's year-round permanent population declined slightly (-1%). Despite the loss of 71 permanent residents, an additional 3,802 new housing units were built in the community during the same period. This marks a continued increasing trend toward seasonal residences; in 2010, 74 percent of the housing units were seasonal residences and one in four units was a rental. Most new homes were built or purchased by people who live permanently elsewhere, many of whom are older and retired or nearing retirement; some ultimately plan to live permanently in Ocean City while many others have purchased units as investment properties which they use part-time and otherwise rent whenever possible. In 2010 the average age was 54 years, much older than the national average of 37.2 years. From 2006 to 2010 Ocean City's median income was $49,000 – slightly below the national average of $51,900; during that period approximately 18.1 percent of the population was living below the poverty level. In 2010, 8 percent of the residents were minorities (Black, African American or Other). When compared to the rest of the country, the percentage of high school graduates was slightly below average while the percentage of those who have some education beyond high school was well above average, reflecting the retiree population.

- **Snow Hill, Maryland**

Surrounded by farmland, Snow Hill is a small town along the Pocomoke River. It is the county seat of Worcester County and one of the oldest towns in Maryland. Still known for its agricultural and maritime history, Snow Hill today is emerging as an arts community on the Lower Eastern Shore. From 2000 to 2010 Snow Hill's year-round permanent population decreased by 13 percent. Despite the loss of 306 residents, an

additional 41 new housing units were built in the community during the same period. The community is generally a year-round community with very few seasonal housing units (only 1% in 2010), although there is a high percentage of rental units (43% in 2010). With a median age of 44.7 years (in 2010) Snow Hill – like its neighbor Berlin – is generally younger and families are generally larger with more children when compared to other gateway communities. Snow Hill's median household income from 2006 to 2010 of $40,313 was below the national average of $51,900; during that period approximately 7.6 percent of the population was living below the poverty level. In 2010 43 percent of the residents were minorities (Black, African American or Other). When compared to the rest of the country, the percentage of high school graduates was well above average while the percentage of those who have some education beyond high school was also above average.

- **Ocean Pines, Maryland**

The planned community of Ocean Pines, established in 1968, encompasses 3,500 acres of former farm and wooded land with nine miles of waterfront in Worcester County. Originally marketed as a summer retreat for retirees, Ocean Pines today offers housing and lifestyle options for all ages. From 2000 to 2010 Ocean Pine's population grew by 12 percent (867 new residents) and the number of housing units increased by 25 percent (1,787 new units). The community is a mixed community with approximately 2/3 year-round units and 1/3 seasonal units, although there is a high percentage of rental houses (31% in 2010). A median age of 57.6 years (in 2010) reflects Ocean Pines' early years when it was marketed as a retirement community. Median household income from 2006 to 2010 of $63,370 was well above the national average of $51,900; during that period approximately 8.3 percent of the population was living under the poverty level. In 2010 only 5 percent of the residents were minorities (Black, African American or Other). When compared to the rest of the country, the percentage of high school graduates was average while the percentage of those who have some education beyond high school was well above average.

### 3.14.3 ECONOMIC BENEFITS OF TOURISM

Maryland reports that in 2010, visitors to Worcester County spent $1,220.9 million during their visit, supporting 12,000 jobs in the tourism economy (Tourism Economics 2011) (table 3.19). Payroll paid by travel-related firms and directly attributable to local visitor spending was $390.5 million. Combined visitor spending and payroll expenditures generated $249.4 million in state and local sales tax revenues.

Virginia reports that in 2010, visitors to Accomack County spent $145.08 million during their visit, supporting 1,850 jobs in the tourism economy (US Travel Association 2011) (table 3.19). Payroll paid by travel-related firms and directly attributable to local visitor spending was $31.39 million. Combined visitor spending and payroll expenditures generated $6.95 million in state sales tax revenue and $4.15 million dollars in local sales tax revenues.

**Table 3.17 Economic Impacts of Tourism (2010)**

| | Worcester County (MD) | Accomack County (VA) |
|---|---|---|
| **Expenditures** | $1,220.9 million | $145.08 million |
| **Payroll** | $390.5 million | $31.39 million |
| **Employment** | 12,000 | 1,850 |
| **State and Local Tax Receipts** | $249.4 millions | $11.1 million |

*Source: Tourism Economics 2011 (for Maryland), U.S. Travel Association 2011 (for Virginia)*

### 3.14.4 ECONOMIC BENEFITS OF ASSATEAGUE ISLAND NATIONAL SEASHORE

- **Visitor Spending**

In 2014 all visitors to the seashore spent approximately $90,417,200 in the local economy (NPS 2015a, located at http//www.nature.nps.gov/socialsciend/economics.cfm). That spending had a cumulative benefit to the local economy of $102,346,900. Generally, visitors from outside the local region spent the vast majority of these dollars; local resident visitors spent relatively little. In general, lodging (30.6%) and restaurant/bar (20.3%) accounted for almost half of spending. Transportation expenses (mainly auto fuel) accounted for 11.9 percent, admission and fees (10.2%), and souvenirs and other expenses (9.9%).

- **Employment Impacts and Value Added**

In 2014, visitor spending supported creation of approximately 1,241 jobs in the local economy (NPS 2015a). These jobs generated approximately $35,689,000 in labor income and $62,774,000 in total value added (NPS 2014a).

**Table 3.18**

Assateague Island National Seashore
**Local-Level Impacts of NPS Visitor Spending**

**Benefits (2014)**

**Visitor Spending**

- all visitors – $90,417,200

**Impacts of Non-Local Visitor Spending**

- jobs – 1,241
- labor income – $35,689,000
- value added – $93,783,000

*Source: NPS 2015a*

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CHAPTER 4

# ENVIRONMENTAL CONSEQUENCES


**4.1** General Methodology for Analyzing Impacts ..... 4-1
**4.2** Water Resources ..... 4-4
**4.3** Vegetation ..... 4-30
**4.4** Wildlife ..... 4-55
**4.5** Federally Listed Threatened or Endangered Species ..... 4-82
**4.6** Historic Structures ..... 4-108
**4.7** Cultural Landscapes ..... 4-117
**4.8** Seashore Operations ..... 4-126
**4.9** Access and Circulation ..... 4-143
**4.10** Visitor Use and Visitor Experience ..... 4-159
**4.11** Socio-Economic Environment ..... 4-178
**4.12** Relationship between Local Short-term Uses of the Environment and Maintenance of Long-term Productivity ..... 4-196
**4.13** Irreversible or Irretrievable Commitments of Resources ..... 4-196
**4.14** Adverse Impacts that could not be Avoided ..... 4-197

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# 4. ENVIRONMENTAL CONSEQUENCES

This chapter describes the probable consequences of the seashore management alternatives on natural and cultural resources, seashore operations, access and circulation, visitor use and visitor experience, and the socio-economic environment. Because the management alternatives are general in nature, the analysis of impacts is also general. The impact topics include the seashore resources or conditions which relate to planning issues and concerns at the seashore, as well as resources or conditions potentially affected by management actions proposed in the alternatives.

## 4.1 General Methodology for Analyzing Impacts

In accordance with CEQ regulations, the analysis of impacts desribes the direct, indirect, and cumulative impacts of management actions (40 CFR 1502.16) and assesses the significance of the impacts (40 CFR 1508.27). Where appropriate, the evaluation of impacts also describes mitigating measures for adverse impacts. Because the specific methods appropriate to assess impacts for each resource varies, the introduction to each impact topic discussion includes a summary of the methodology used.

### 4.1.1 GEOGRAPHIC AREA EVALUATED FOR IMPACTS

The primary area of impact for the GMP/EIS is the Maryland portion of Assateague Island, although alternatives may also affect areas on the Maryland mainland, the Virginia mainland, the coastal bays to the west of Assateague Island, and the Toms Cove area and access to it.

### 4.1.2 ANALYSIS OF IMPACTS

The impact analysis addresses all of the following:

| | |
|---|---|
| **Direct Impacts** | Impacts that would occur as a direct result of NPS management actions. |
| **Indirect Impacts** | Impacts that would occur because of NPS management actions, but would occur later in time or farther in distance from the action. |
| **Beneficial Impact** | A positive change in the condition or appearance of the resource or a change that moves the resource toward a desired condition. |
| **Adverse Impact** | A change that degrades the resource, or moves the resource away from a desired condition, or detracts from its appearance or condition. |

**Cumulative Impacts** Defined as "the impact on the environment which results from the incremental impact of the action when added to other past, current, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR 1508.7).

To assess cumulative impacts, the GMP planning team identified actions taken by others in the surrounding area which, although unrelated to the GMP alternatives, could have impacts on the same resources or values, resulting in an additive (cumulative) effect when considered in combination with the impacts of the actions proposed in the alternatives. By generally assessing the impacts of those other actions and combining those impacts with the impacts of the GMP alternatives, the GMP planning team was able to estimate an overall cumulative impact as well as the relative contribution of the alternative to the cumulative effect.

### 4.1.3 ASSESSING IMPACTS USING COUNCIL ON ENVIRONMENTAL QUALITY (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:

**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.

**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 adverse and beneficial.
(2) A significant effect may exist even if the federal agency believes that on balance the effect would be beneficial.
(3) The degree to which the proposed action affects public health or safety.
(4) Unique characteristics of the geographic area such as proximity to historic or cultural resources, parklands, prime

farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.

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

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

(7) 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.

(8) 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.

(9) 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.

(10) 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.

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

Context provides a comparison that helps to put the relative importance of the impacts into perspective and can include such things as geography, population size, uniqueness of the resource, affected individuals, agency mandates and more.

The NPS is an agency with a “conservation” mandate and identifies fundamental resources and values in its GMPs, defined as those resources or values that are critical to achieving a park’s purpose or maintaining its significance. Collectively, these resources and values capture the essence of the seashore and provide overall context for evaluating the relative severity of an impact, e.g. the degree to which an alternative would help or hinder these resources would be important in assessing whether impacts of that alternative are significant. Fundamental resources and values, other important resources, and related resources are identified for Assateague National Seashore in section 1.4.3 of this GMP/EIS.

For each impact topic analyzed, an assessment of the potential significance of the impacts according to context and intensity is provided in the conclusion section that follows the discussion of the impacts under each alternative. In addition to the overall context of the seashore's purpose and significance, resource-specific context is presented in the methodologies section under each impact topic and applies across all alternatives. Intensity of the impacts is discussed by considering the relevant factors from the above list. Intensity factors that do not apply to a given impact topic and/or alternative are not discussed.

## 4.2 Water Resources

### 4.2.1 METHODOLOGY FOR ANALYZING IMPACTS

Management actions are qualitatively analyzed with respect to their potential to benefit or adversely impact the quality and quantity of the seashore's water resources, including groundwater, freshwater ponds, wetlands, floodplains, estuarine waters, and ocean waters. Responses to natural coastal processes and the effects of climate change/sea level rise are analyzed to identify potential impacts to water resources. Actions are identified and analyzed that have the potential to release and convey pollutants to surface waters and groundwater because of soil disturbance, treatment and discharge of wastewater, inadvertent discharge of petroleum products, accidental chemical spills, and planned application of chemicals for management of insects and invasive plants. Actions are also identified and analyzed that would likely occur within floodplains, potentially affect wetlands, or increase demand for potable water drawn from the groundwater aquifer. For this analysis, it is assumed that during final design for specific projects, best management practices (BMPs) for water resource protection would be identified and during construction, these measures would be implemented to mitigate adverse impacts to water quality and maintain runoff at pre-development discharge rates.

The resource-specific context for the evaluation of impacts on water resources is as follows:

- High quality water resources within the seashore's boundary are fundamental to the seashore's purpose and significance.
- Barrier island habitats including freshwater wetlands and saltmarshes are fundamental to the seashore's purpose and significance.
- Aquatic habitats including the open ocean, estuarine waters, and saltmarshes are fundamental to the seashore's purpose and significance.
- The waters and mainland watershed of the coastal bays (Chincoteague and Sinepuxent Bays) and Atlantic Ocean are resources that are related to the seashore because the activities that occur outside the seashore but within the

watershed affect the integrity of many of the seashore's fundamental resources.

- Water quality within the coastal bays is declining, with phosphorus consistently the largest water quality concern.
- Development of 158,386 feet of marsh mosquito ditches at the seashore have severely altered marsh hydrology at the seashore, disrupting natural flow of tidal water into and out of the seashore's marshes and degrading estuarine water quality by increasing nutrient export from marshes (NPS 2011d).
- *Pragmites australis* has invaded many of the seashore's freshwater shrub wetlands (representing >40% cover on 5.6% of the total area of the seashore (NPS 2011d)), adversely impacting sediment levels and hydrologic flows.

### 4.2.2 ALTERNATIVE 1 – CONTINUATION OF CURRENT MANAGEMENT

- **Impact Analysis**

**Coastal Response Management Actions.** Facilities lost or damaged by natural coastal processes or the effects of climate change/sea level rise would be replaced or repaired, if funding is available. Facilities to be replaced would be moved back from the shoreline and made more sustainable in form and function, at sites that would continue to be protected by investment in dune maintenance. Wetlands would be avoided, although all new sites would be within the 100-year floodplain. Previous development sites would be rehabilitated to foster a return to natural conditions. These actions would benefit water resources by increasing the distance between the shoreline and the potential source of pollutants at parking areas, comfort stations, maintenance facilities, and sites where chemicals subject to accidental spills are handled. Adverse impacts to water resources would continue as facilities in the floodplain would be replaced in kind for as long as possible. NPS would use best management practices to address stormwater and water quality during and following demolition of damaged facilities and new construction. Permitting requirements would be addressed with the state of Maryland, as appropriate, in advance of any removal and replacement activity. In general, NPS would seek to use non-structural stormwater management and alternatives in the design and construction of new facilities, including the use of alternatives to asphalt paving, to improve groundwater recharge and reduce runoff and erosion. Such measures would benefit water resources by generally slowing sheetflow into adjoining areas and reducing the risk of sedimentation and erosion over the long-term. Solid waste generated by facility replacement would be properly disposed on the mainland, thus removing fill previously placed in the floodplain and offsetting placement of new fill required for new facilities.

**Natural Resource Management Actions.** NPS would continue scientific and scholarly research focused on developing a better understanding of natural coastal processes and the effects of climate change/sea level rise. Existing programs documenting water quality conditions in the coastal bays would continue. NPS would also implement a

baseline groundwater monitoring program, and continue to monitor the distribution and abundance of submerged aquatic vegetation (SAV). Collectively, these data would enhance understanding of water quality conditions, trends, and pollutant sources, help focus future research and monitoring to address water quality threats within the watershed, and provide the basis for defining and implementing measures to adapt to change and reduce the adverse effects of sea level rise.

Existing partnerships and cooperative relationships with Maryland and Virginia resource management agencies, Worcester County, Accomack County, the Maryland Coastal Bays Program, and various academic institutions and conservation organizations would continue to support ongoing water resource monitoring, research, and watershed conservation planning. These partnerships would continue to benefit the seashore's water resources by providing information needed to better understand water quality conditions, trends, and pollutant sources, and by facilitating coordinated efforts toward addressing water quality threats within the watershed. Cooperative research could also help identify new approaches to minimizing the effects of sea level rise at the seashore.

Management actions would continue to restore island habitats altered by historic land use, including removal of six hunting lodges, two private residences, access roads, and water impoundments in the seashore's backcountry. Structures and other impervious surfaces would be removed and sites rehabilitated to foster a return to natural conditions. There would be a beneficial impact on water resources by restoring natural runoff and infiltration characteristics and removing potential pollutants present at former development sites. During demolition and removal of structures, NPS would mitigate potential impacts to water resources by implementing best management practices for water quality protection. Solid waste generated by facility replacement would be properly disposed on the mainland.

Filling mosquito ditches in the Maryland portion of the seashore would continue. Currently, the seashore has filled about 10 percent of its 48,000 meters of mosquito ditches. Continued ditch restoration would have a beneficial impact on water resources by helping to restore natural surface and groundwater flows from the island to the bayside and tidal flows in and out of saltmarshes. This would enhance the health and function of saltmarshes and reduce nutrient export from marshes to bay waters. During the filling process, NPS would mitigate potential impacts to water resources by implementing best management practices for water quality protection.

*Phragmites australis* removal from inland wetlands would continue using a combination of standard, ground-based control methods in combination with aerial spraying and prescribed fire or mowing as needed in heavily infested areas. These actions would have a beneficial impact on water resources by helping to restore natural sediment levels and hydrologic flows. Systemic herbicides would be used that do not bioaccumulate in the aquatic food chain, that exhibit very low toxicity to bacteria, fungi,

and animals, and that are rapidly removed from the environment by chemical bonding with soil particles and microbial degradation.

NPS would continue other ongoing natural resource management actions that could affect water resources, such as other vegetation restoration and protection, and beach and bayside wetlands protection. Resulting human intervention in natural processes, when necessary, could affect water resources both beneficially and adversely when chemical or mechanical methods are used. Mechanical actions could result in localized disturbances causing erosion and subsequent sedimentation in nearby waters. NPS would mitigate potential impacts to water resources by implementing best management practices for water quality protection.

**Cultural Resource Management Actions.** NPS efforts to identify, manage, and protect cultural resources would continue. These would not noticeably affect water resources. When historic structures could no longer be protected from natural coastal processes and the impacts of climate change/sea level rise, they would be demolished and the sites restored to foster a return to natural conditions. There would be a beneficial impact on water resources by restoring natural runoff and infiltration characteristics and removing potential pollutants that could be present. During demolition, NPS would mitigate potential impacts to water resources by implementing best management practices for water quality protection.

At the Assateague Beach U.S. Coast Guard Station, boat dock repairs would expose soil to erosion, with the potential for sedimentation in Toms Cove. Restoration of electrical service would have minor short-term adverse impacts on water quality associated with trenching for conduit installation from the Tom's Cove recreational beach to the station. NPS would mitigate potential impacts during and following construction by implementing best management practices for water quality protection.

**Visitor Use and Visitor Experience Management Actions.** Environmental education programs would be enhanced and supported by rehabilitation of the seashore's previous visitor center as an environmental education center. This would benefit water resources by offering greater opportunities to educate the public regarding the seashore's water resources, water quality issues, and stewardship of water resources.

OSV use on the beach would continue to have the potential to result in petroleum pollutants entering ocean waters. By continuing to strictly enforce rules for driving on the beach, the potential for adverse impacts would be minimized. If vehicular access is lost, and the breach management plan recommends that the breach remain open, there would be a beneficial impact to water resources because vehicles would be eliminated from part or all of the current OSV use area.

Operation of private boats would continue to emit petroleum products into the water column and/or cause sediment disturbances in shallow waters where propellers make contact with the bay bottom. NPS would continue to educate visitors regarding potential resource impacts associated with boating in shallow waters.

**Seashore Operations Management Actions.** Based on analysis of historic visitation counts, seashore visitation in Maryland is expected to increase by approximately 8,000 visitors per year as long as there is vehicular access to the seashore. The majority of this growth will be in day-use visitors, as campgrounds are already at capacity most days during the peak summer season. Daily water consumption by day-use visitors is very low, estimated at less than five gallons per day; as a result, visitation growth would result in a modest increase daily demand for potable water. In Maryland, increased demand could be met by the two existing groundwater wells in the Maryland Island Developed Area; these wells currently provide approximately 10,000 gallons/day on peak days, representing approximately 20 to 25 percent of their daily production capacity. In Virginia, potable water would be supplied by the town of Chincoteague, piped by FWS to the recreational use area, and water for cold showers would be available from four existing shallow wells. Additional wastewater volumes associated with increased visitation would be hauled to treatment plants on the mainland where there is excess capacity available to handle the additional flows.

Routine seashore operations and maintenance activities could adversely impact water resources if activities release pollutants into nearby wetlands and surface waters. Existing maintenance facilities, solid waste transfer locations, and comfort stations where wastewater is routinely pumped would be locations where accidental spills and soil disturbances could occur with the potential to impact nearby waters. NPS would mitigate potential impacts to water resources by implementing best management practices for water quality protection.

NPS would maintain its existing fleet of work and patrol boats. Normal storage and operation of these vessels would continue to reduce water quality via inadvertent petroleum discharges/spills from refueling and contribution to runoff from impervious surfaces at the fleet storage and maintenance areas. Operation of the NPS fleet would continue to emit petroleum products into the water column and/or cause sediment disturbances in shallow waters in the bay from accidental propeller contact with the bottom. NPS would mitigate potential impacts to water resources by implementing best management practices for water quality protection.

Miscellaneous enhancements to the seashore's wastewater treatment facility, campground wastewater treatment facilities, and wastewater dump stations would benefit groundwater and bay water quality by providing more effective wastewater treatment. Addition of tertiary treatment of wastewater at the NPS treatment plant on the mainland would reduce nutrient discharge to the bay by applying treated effluent to

wetlands; impacts of this project were analyzed in a separate document (NPS 2003) which concluded that the project would have a moderate, long-term beneficial impact on bay waters compared to continuing to discharge into Sinepuxent Bay.

Miscellaneous repairs would be made to the seashore's headquarters complex and routine maintenance to the seashore's roads would continue, such as repaving and minor drainage enhancements. Minor soil disturbances would be associated with these maintenance actions. NPS would mitigate potential impacts to water resources by implementing best management practices for water quality protection.

Development of additional housing for seasonal employees would increase the demand for potable water and wastewater treatment:

- At the existing NPS housing complex adjacent to seashore headquarters in Maryland, development of 20 additional bedrooms would require an additional 1,500 gallons of potable water per day. NPS's three existing deep wells have excess capacity to meet this demand. Wastewater would be treated at the seashore's treatment plant on the mainland and would likely require minor expansion to the existing facility and an amended permit for additional effluent discharge.
- At the FWS maintenance facility in Virginia, development of 17 additional bedrooms for seasonal employees would require 3,400 to 5,100 gallons of potable water per day. Potable water would be obtained from a new groundwater well or by tying into the Wallops Island potable water system, which has excess capacity. Wastewater treatment would require installation of a package plant or a community on-site wastewater disposal system; proper site design, installation, and maintenance of wastewater facilities would mitigate potential contamination of groundwater or ocean or bay waters.

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions within the coastal bays watershed have the potential to impact water resources within the seashore. These actions generally include: development on private property, agricultural activities, public development projects, transportation system improvements, sand transport projects, dredging projects, and offshore development projects that have resulted in or could result in discharge of pollutants to waterways and ocean waters. Potential pollutants from these activities within the coastal bays watershed have historically included urban runoff, erosion and sedimentation, combined sewer overflows, improperly functioning on-site disposal systems (OSDS), and agricultural runoff. In the future pollutant loading from these sources will continue, although at reduced levels when compared to the past. OSDSs and sewer overflows will decrease somewhat as municipal sewers are installed and combined sewers are eliminated. This benefit will be somewhat offset by new development in the watershed that occurs outside of sewer service areas, requiring

use of OSDSs that have historically provided inadequate treatment due to poor maintenance. Future stormwater runoff and erosion and sedimentation from construction sites greater than one acre would be reduced by mitigation measures required pursuant to water pollution control permits of the states, counties, cities, and towns.

Other actions with cumulative impacts to water resources include: sand transport projects; sediment dredging projects; actions by the US FWS implementing the comprehensive conservation plan for Chincoteague National Wildlife Refuge; actions by others to implement plans and programs focused on water resource management, such as the Maryland Coastal Bays Program, the Maryland Coastal Zone Enhancement Plan, the Virginia Coastal Resources Management Program and, natural resource management actions of Accomack County and Worcester County; and land uses within and outside the region that adversely impact air quality, contributing to high levels of ozone and atmospheric deposition of nitrogen at the seashore.

The overall cumulative impacts would be primarily beneficial because the overall condition of water resources would be improved because of collaborative efforts by public agencies, local governments, and non-profit partners to reduce pollutant loads from point and non-point sources throughout the coastal bay watersheds. Alternative 1 would add a noticeable increment to the overall beneficial cumulative impact through reduction in stormwater runoff at existing seashore facilities. There would also be adverse cumulative impacts associated with pollutant discharges from previously permitted and new construction activities and land uses within the watershed, particularly where they occur outside sewer service areas. Alternative 1 would add an imperceptible increment to the overall adverse cumulative impact due to short term stormwater runoff from active construction sites.

- **Conclusions**

In alternative 1 management actions would have both adverse and beneficial impacts on water resources and would add an imperceptable adverse increment and a noticeable beneficial increment to the total cumulative adverse and beneficial impacts on water resources, respectively.

Adverse impacts would result from potential water contamination associated with continued private motorboat use, OSV use, routine seashore operations and maintenance, and use of chemical treatments to manage vegetation, insect, and wildlife populations, as well as from minor additional groundwater withdrawals for potable water supply. Development of visitor use facilities to replace those lost or damaged by coastal storms or the effects of climate change/sea level rise and removal of structures associated with historic land uses on the island could have temporary adverse impacts on water resources depending on the nature and location of the actions. These impacts would not be significant because of the simultaneous implementation of best

management practices and continued actions consistent with NPS management policies protecting water resources, within the context of the overall quality of water resources throughout the seashore.

Beneficial impacts would result from restoring natural surface and groundwater flows by filling remaining mosquito ditches, enhancing hydrologic flows and reducing sedimentation by reducing the aerial coverage of *Phragmites australis* from 5.6 percent to 2 percent, restoring natural surface water flows and removing potential pollutants by rehabilitating island habitats altered by historic land use, promoting public stewardship of water resources by increasing environmental education, reducing nutrient loads to bay waters by improving wastewater treatment, and supporting water quality restoration within the watershed through ongoing partnerships for water resource monitoring, research, and watershed conservation planning. In general, on the island and on the mainland floodplain functions would be slightly enhanced and flood potentials would be minimally reduced. No wetland resources would be lost and wetland functions and values would be enhanced throughout the seashore. Collectively, the beneficial impacts would not be significant because while management actions would benefit water resources that are fundamental or related to the seashore and would address significant threats to those resources, the impacts would be short-term (continuing until access is lost and/or resources are no longer available to sustain natural resource management programs) and not readily apparent. Once vehicular access is lost, rehabilitation and restoration of island habitats would slow and possibly be curtailed with the result that the beneficial impact on water resources would be greatly reduced.

### 4.2.3 IMPACTS COMMON TO ALL ACTION ALTERNATIVES

- **Impact Analysis**

**Coastal Response Management Actions**. As in alternative 1, under alternatives 2, 3, and 4, facilities lost or damaged by natural coastal processes or the effects of climate change/sea level rise would be replaced or repaired, if funding is available, consistent with the underlying principles of each alternative. While the timing and extent to which facilities would continue to be replaced would vary in alternatives 2, 3, and 4, the nature of the impacts on water resources associated with replacement would be similar to those described for alternative 1 (section 4.2.2).

**Visitor Use and Visitor Experience Management Actions.** Until facilities are lost, NPS would generally increase visitor services within the Maryland Island Developed Area. A few new small structures (with parking) would be added to support commercial services within existing previously disturbed visitor use areas. Minor soil disturbances would be associated with construction of these structures and rooftops would add impervious surfaces. NPS would mitigate potential impacts to water resources by implementing best management practices for water quality protection and stormwater management.

The former visitor center would be rehabilitated as a stand-alone environmental education center. Minor soil disturbances would occur; no additional impervious surface would be added. NPS would mitigate potential impacts to water resources by implementing best management practices for water quality protection.

**Seashore Operations Management Actions.** In collaboration with MD DNR, NPS would develop a new seashore entrance station on the mainland, requiring realignment and widening of MD 611, construction of entrance booths, and addition of employee parking spaces. The entrance station would be located within the 100-year floodplain because an alternative site located outside the floodplain would not be available within the MD 611 corridor in suitable proximity to the seashore entrance. During construction, road widening and addition of facilities would expose soil to erosion with the potential for sedimentation in nearby waterways; construction vehicle operations would increase potential for petroleum products to enter runoff from the construction site. Following construction, site specific risk to human health and property would be negligible; placement of fill within the floodplain would include impervious paving and fill needed to raise the new entrance station above the level of the 100-year storm to reduce flood risk to health and property, resulting in the potential for slight increases in runoff rates and volumes that could minimally affect local flooding; visitor vehicles queuing at the entrance station would increase the potential for petroleum products to enter runoff from the site. NPS and MD DNR would mitigate potential impacts during and following construction by implementing best management practices for stormwater management and water quality protection. Facility design would seek to ensure that there would be no increase in runoff rate and volume from the site following development. Collectively these actions would result in a potential adverse impact on water resources, which would continue as long as vehicular access to the island is possible.

Development of a mainland-based alternative transportation system (ATS) would require development of a shuttle staging area and associated unpaved parking area (for approximately 360 cars) on the mainland and shelters and paved pull-offs at three shuttle stops on the island. The staging area and shelters would be located within the 100-year floodplain because alternative sites located outside the floodplain would not be available on the island or within the MD 611 corridor in suitable proximity to the seashore entrance. During construction, soils would be exposed to erosion with the potential for sedimentation in nearby waterways; construction vehicle operations would increase potential for petroleum products to enter runoff from the construction site. Following construction, site-specific flood risk to human health and property would be negligible; placement of fill within the floodplain would be limited to pervious paving on the mainland and installation of shuttle stops on the island, resulting in the potential for minimal increases in runoff rates and volumes that could affect local flooding; visitor vehicles parked at the facility would increase the potential for petroleum products to enter runoff from the site. NPS would mitigate potential impacts during and following construction by implementing best management practices for stormwater management

and water quality protection. Facility design would seek to ensure that there would be no increase in runoff rate and volume from the site following development. Collectively these actions would result in a potential adverse impact on water resources, which would continue as long as vehicular access to the island is possible.

Non-structural stabilization of the mainland shoreline near the visitor center would benefit water quality by reducing shoreline erosion and sedimentation of bay waters.

### 4.2.4 ALTERNATIVE 2 – CONCENTRATED TRADTIONAL BEACH RECREATION

- **Impact Analysis**

**Coastal Response Management Actions.** Artificial dune fortification and beach nourishment would protect the Maryland Island Developed Area from the effects of natural coastal processes and climate change/sea level rise as long as suitable land base exists and funding is available. The seashore would expand partnerships with the USACE to provide additional sand to provide additional sand to mitigate the erosional forces associated with storms and/or sea level rise. This effort, as well as planting of dunes and fencing to trap sand and exclude grazing horses from the dune, could substantially slow the loss of the developed area to natural coastal processes. As land and facilities are lost, they would be rebuilt using more sustainable design within the remaining protected developed area, concentrating visitor use and facilities within a smaller area. To the maximum extent, facilities would be temporary, designed to be removed in advance of coastal storms. As in alternative 1, NPS would use best management practices to address stormwater and water quality during and following demolition of damaged facilities and new construction. Permitting requirements would be addressed with the state of Maryland, as appropriate, in advance of any removal and replacement activity. In general, NPS would seek to use non-structural stormwater management in design and construction of new facilities to slow sheetflow and reduce the risk of local flooding and erosion and sedimentation, although this would become increasingly difficult due to the concentration of visitor use and facilities within a shrinking area. Collectively these actions would result in a potential adverse impact on water resources, which would continue as long as vehicular access to the island is possible.

**Natural Resource Management Actions.** Studies would be completed as in alternative 1. However, the ability of NPS to encourage and support cooperative research would likely decline, adversely impacting efforts to address the challenges of climate change/sea level rise and diminishing detection of emerging threats to the seashore's water resources. Water quality monitoring could decrease in frequency reducing information needed to better understand water quality conditions, trends, and pollutant sources, and to help focus collaboration with other public agencies, academic institutions, and non-governmental organizations to address water quality threats within the watershed; emerging threats to water resources would be less likely to be detected and addressed.

Natural resource management programs and activities would continue as in alternative 1 although over time their scope would diminish as support for natural resource management would likely be re-directed toward activities protecting recreation opportunities. Filling mosquito ditches in the Maryland portion of the seashore would likely diminish, reducing benefits to the health and function of saltmarshes with less benefit to bay water quality due to reducing nutrient export from marshes.

Reduced scope of other natural resource management actions that could affect water resources, such as *Phragmites australis* removal, other vegetation restoration and protection, and beach and bayside wetlands protection would result in less human intervention. This could affect water resources both beneficially and adversely when chemical or mechanical methods are used. Fewer herbicides used to remove invasive species, such as *Phragmites australis*, could help to reduce migration into ground or surface waters, affecting water quality and aquatic habitat. Fewer mechanical actions could result in fewer localized disturbances causing erosion and subsequent sedimentation in nearby waters.

Reduced access to the north end – by eliminating high density use in the north end – would reduce visitor use and decrease the complexity of natural resource management due to fewer visitor/resource conflicts. There would be reduced potential for contamination from petroleum products due to fewer boats visiting the north end.

Working with Virginia to ensure appropriate wastewater treatment and disposal at privately owned structures (oyster watch houses and hunting blinds) located within the seashore's Virginia waters would reduce discharge of nutrients, pathogens, and other contaminants into bay waters.

**Cultural Resource Management Actions.** NPS efforts to identify, manage, and protect cultural resources would continue. These would not noticeably affect water resources. When historic structures could no longer be protected from natural coastal processes and the impacts of climate change/sea level rise, they would be demolished and the sites restored to foster a return to natural conditions. There would be a beneficial impact on water resources by restoring natural runoff and infiltration characteristics and removing potential pollutants that could be present. During demolition, NPS would mitigate potential impacts to water resources by implementing best management practices for water quality protection.

**Visitor Use and Visitor Experience Management Actions.** Analysis of visitor use and visitor experience management actions identified no associated impacts on access and circulation

**Seashore Operations Management Actions.** Seashore operations would be based in a rehabilitated headquarters complex in the Maryland Mainland Developed Area, which is located above the 100-year floodplain. During construction minor areas adjacent to the

existing buildings and parking areas would be disturbed and soils exposed to erosion with the potential for sedimentation in nearby waterways; vehicle operations would increase potential for petroleum products to enter runoff from the construction site. Following construction, runoff rates and volumes would generally remain the same or be reduced; NPS staff and maintenance vehicle parking would continue at current levels with the same or less potential for petroleum products to enter runoff from the site. NPS would mitigate potential impacts during and following construction by implementing best management practices for stormwater management and water quality protection that would likely better control runoff and contain pollutants on-site than the existing facility. Collectively these actions could have a beneficial impact on water resources.

Approximately 10 acres would be acquired near the existing seashore headquarters complex to develop a shuttle staging area and associated visitor unpaved parking area (for approximately 360 cars). Construction of this facility is common to alternatives 2, 3, and 4, although where the action would occur would vary slightly withnear the seashore headquarters complex. Impacts on water resources are summarized above in section 4.2.3.

Electricity and potable water would be extended to approximately 90 existing campsites. During construction, trenching for underground installation of lines would expose soil to erosion with the potential for sedimentation in nearby waterways. NPS would mitigate potential impacts during and following construction by implementing best management practices for water quality protection. With full occupancy of the 90 sites served with potable water, total additional daily water consumption is estimated to be approximately 2,160 gallons/day (assuming six gallons of water/camper/day and an average four campers/RV). Increased demand could be met by the two existing groundwater wells in the Maryland Island Developed Area; these wells currently provide approximately 10,000 gallons/day on peak days, representing approximately 20 to 25 percent of their daily production capacity. Additional wastewater volumes associated with increased visitation would be hauled to treatment plants on the mainland where there is excess capacity available to handle the additional flows.

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have impacts on water resources would be the same as those identified for alternative 1.

The overall cumulative impacts would be primarily beneficial because the overall condition of water resources would be improved because of collaborative efforts by public agencies, local governments, and non-profit partners to reduce pollutant loads from point and non-point sources throughout the coastal bay watersheds. Alternative 2 would add a noticeable increment to the overall beneficial cumulative impact through reduction in stormwater runoff at existing and future seashore facilities. There would

also be adverse cumulative impacts associated with pollutant discharges from previously permitted and new construction activities and land uses within the watershed, particularly where they occur outside sewer service areas. Alternative 2 would add an imperceptible increment to the overall adverse cumulative impact due to short term stormwater runoff from active construction sites.

- **Conclusions**

In alternative 2 management actions would have both adverse and beneficial impacts on water resources and would add an imperceptible adverse increment and a noticeable beneficial increment to the total cumulative adverse and beneficial impacts on water resources, respectively.

Adverse impacts would result from potential water contamination associated with continued private motorboat use, OSV use, routine seashore operations and maintenance, and use of chemical treatments to manage vegetation, insect, and wildlife populations, as well as from minor additional groundwater withdrawals for potable water supply. Construction activities associated with replacement of lost or damaged visitor use facilities within the island developed area, removal of structures associated with historic land use on the island, rehabilitation of the seashore headquarters complex, and development of new facilities (a seashore entrance station and ATS parking facility) could have temporary adverse impacts on water resources depending on the nature and location of the actions. New development in the floodplain on the mainland (entrance station and ATS parking (short-term)) would have the potential to minimally affect floodplain functions. Collectively, the adverse impacts would not be significant because of the simultaneous implementation of best management practices and continued actions consistent with NPS management policies protecting water resources, within the context of the overall quality of water resources throughout the seashore.

Beneficial impacts would result from restoring natural surface and groundwater flows by filling remaining mosquito ditches, enhancing hydrologic flows and reducing sedimentation by reducing the aerial coverage of *Phragmites australis* from 5.6 percent to 2 percent, restoring natural surface water flows and removing potential pollutants by rehabilitating island habitats altered by historic land use, limiting use of the north end beach, reducing shoreline erosion by stabilizing the mainland shoreline using non-structural measures, promoting public stewardship of water resources by increasing environmental education, reducing nutrient loads to bay waters by improving wastewater treatment, reducing discharges from private structures (oyster houses and hunting blinds) in Virginia waters, and supporting water quality restoration within the watershed through ongoing partnerships for water resource monitoring, research, and watershed conservation planning. Floodplain functions on the island would be slightly enhanced and flood potentials would be minimally reduced. No wetland resources would be lost and wetland functions and values would be enhanced throughout the

seashore. Collectively, the beneficial impacts would not be significant because, while management actions would benefit water resources that are fundamental or related to the seashore, the impacts would be short-term (continuing until access is lost and/or resources are no longer available to sustain natural resource management programs) and probably not readily apparent, depending on when NPS resources are redirected away from rehabilitation and restoration of island habitats to maintenance and fortification of the developed area. Once vehicular access is lost, rehabilitation and restoration of island habitats would slow and possibly be curtailed, with the result that the intensity of the beneficial impacts on water resources would be greatly diminished.

### 4.2.5 ALTERNATIVE 3 – SUSTAINABLE RECREATION AND CLIMATE CHANGE ADAPTATION (NPS PREFERRED ALTERNATIVE)

- **Impact Analysis**

**Coastal Response Management Actions.** Seashore management would allow the island to evolve naturally, relocating and designing new facilities to be more sustainable. Visitor use infrastructure would evolve to more sustainable designs and likely shift to new, more stable locations initially on the island; over time development on the island would become less intensive, with fewer facilities and less impervious surfaces as visitor use facilities are slowly moved to the mainland. Facilities lost or damaged by natural coastal processes or the effects of climate change/sea level rise would be replaced or repaired, if funding is available, at sites further from the shoreline at sites that do not require continued investment in dune maintenance where they can be made more sustainable in form and function. Previous development sites would be rehabilitated to foster a return to natural conditions. Wetlands would be avoided, although all new sites would be within the 100-year floodplain. Most proposed actions within the floodplain would be functionally dependent upon locations in proximity to water and for which non-floodplain sites would not be a practicable alternative. Collectively these actions would benefit water resources by removing fill from the floodplain and by increasing the distance between the shoreline and the potential source of pollutants at parking areas, comfort stations, maintenance facilities, and sites where chemicals subject to accidental spills are handled. As in alternative 1, NPS would use best management practices to address stormwater and water quality during and following demolition of damaged facilities and new construction. Permitting requirements would be addressed with the state of Maryland, as appropriate, in advance of any removal and replacement activity. In general, NPS would seek to use non-structural stormwater management and alternatives in the design and construction of new facilities, including the use of alternatives to asphalt paving, to improve groundwater recharge and reduce runoff and erosion. Such measures would benefit water resources by generally slowing sheetflow into adjoining areas and reducing the risk of sedimentation and erosion over the long-term. Solid waste generated by facility replacement would be properly disposed on the mainland, thus removing fill previously placed in the floodplain and offsetting placement of new fill required for new facilities.

If bridge access is lost, access would transition to all water access. Beneficial impacts to water resources would result from removal of 150 campsites, other visitor facilities, paved roads, and the NPS maintenance yard, as well as removal of most vehicles from the island; the potential for most spills and leakage of petroleum products and other contaminants would be eliminated and natural infiltration would be enhanced.

**Natural Resource Management Actions.** Studies would be completed as in alternative 1. Cooperative research would expand, accelerating growth in the understanding of seashore resources and ecological processes. Data from an expanded monitoring network, as well as new ecological research, would provide a significant increase in information needed to better understand water quality conditions, trends, and pollutant sources, and would help focus collaboration with other public agencies, academic institutions, and non-governmental organizations to address water quality threats within the watershed. Based on enhanced monitoring results and research findings, more effective and better targeted measures would be implemented to adapt to change and minimize the adverse effects of sea level rise.

Natural resource management programs and activities would continue as in alternative 1 although over time programs would expand to address issues created by global climate change. In alternative 3, actions would generally seek to enhance resiliency of saltmarsh habitats and inland wetlands resulting in a beneficial impact on water resources.

Visitor use impacts on water resources would continue at the north end but would be mitigated through implementation of new management actions. A new docking/entrance permit would control and reduce the number of motorized boats permitted in the area. In addition, a vessel-based restroom would be made available for visitor use. These actions would beneficially impact water resources by reducing emission of petroleum products into the water column and the potential for sediment disturbances in shallow waters of the north end caused by accidental propeller contact with the bay bottom and beaching/mooring of boats. By providing restroom facilities, less human waste would be discharged untreated into bay waters and onto the land in the north end, although there would be the potential for inadvertent spills of untreated wastewater from on-board restroom facilities.

NPS would encourage the state of Maryland to establish an oyster sanctuary within the seashore's waters. Oysters, once established would benefit water quality by filtering impurities from bay water.

Working with Virginia, NPS would assess the legal status of privately owned structures (oyster watch houses and hunting blinds) located within the seashore's Virginia waters and pursue removal of those found to be unauthorized. For authorized structures, NPS would work with Virginia to ensure appropriate wastewater treatment. Collectively,

these actions would reduce discharge of nutrients, pathogens, and other contaminants into bay waters.

Working with Worcester County, Accomack County, and conservation organizations, NPS would support efforts to protect land (through fee simple purchase or conveyance of conservation easements) within the watersheds of Chincoteague Bay and Newport Bay for conservation and climate change adaptation purposes. Conservation of these lands would benefit water resources by reducing or eliminating existing or future developed land uses that have the potential to discharge contaminants to surface waters or that have or could alter runoff characteristics.

NPS would collaborate with its conservation partners to acquire approximately 150 to 200 acres of buffer lands adjoining one to three new points of departure on the Chincoteague Bay mainland in Worcester County. Land conservation would permanently protect the land from development; long-term management would facilitate return to natural conditions, as appropriate, with beneficial impacts to water resources by likely protecting wetlands and floodplains, reducing non-point source discharge of pollutants, and potentially reducing runoff.

NPS would collaborate with partners to expand research to improve understanding of aquatic resources, estuarine ecology, and the effects of human activities on water quality. Research would enable NPS and its partners to better focus water quality management actions to reduce pollutant loads into the coastal bays.

**Cultural Resource Management Actions.** Implementation of non-structural storm protection measures (such as dune nourishment and planting) to protect the Assateague Beach U.S. Coast Guard Station would not affect water resources.

**Visitor Use and Visitor Experience Management Actions.** Once camping facilities are no longer sustainable in the Maryland Island Developed Area or when vehicular access to the island is lost, NPS would collaborate with MD DNR to develop a new campground on the mainland. Facilities would be replaced on an approximate 175-acre site in the MD 611 corridor near the existing seashore headquarters complex. NPS would seek a site that is outside of the 100-year floodplain and where wetland impacts could be avoided. Assuming the site is composed of a mix of upland field and forest, campground development would entail minimal clearing and grading of the site, paved road construction, utility installations, development of 150 campsites (including approximately 40 sites with paved pads/pull-throughs), and construction of comfort facilities, shower buildings, an amphitheater, sewage dump station, and an entrance station with parking). During construction, soils would be exposed to erosion with the potential for sedimentation in nearby waterways; construction vehicle operations would increase potential for petroleum products to enter runoff from the construction site. Following construction, additional paved roads and rooftops would result in the

potential for slight increases in runoff rates and volumes that could affect local flooding; and visitor vehicles parked at campsites would increase the potential for petroleum products to enter runoff from the site. NPS would mitigate potential impacts during and following construction by implementing best management practices for stormwater management and water quality protection. Facility design would seek to ensure that there would be no increase in runoff rates or discharge volume from the site following development due to addition of impervious surfaces. A new well (or wells) would provide water to meet an approximate demand for up to 10,000 to 15,000 gallons/day (assuming use of vault toilets and coldwater showers). Waste from vault toilets would be pumped to tankers and transferred to the seashore's wastewater plant where tertiary treatment would occur prior to upland site discharge of effluent. In general water withdrawals, wastewater volumes and treatment needs, and extent of impervious surfaces would be similar to those of the existing island campgrounds that the new campground would replace, likely resulting in no net increase in groundwater withdrawals, wastewater generation and treatment needs, nutrient and contaminant discharges to the bay, or runoff rates and volumes. Removing the existing campgrounds in the floodplain on the island and replacing it outside the floodplain on the mainland, while avoiding impacts to wetlands, would have a beneficial impact on water resources.

OSV use on the beach would continue to have the potential to result in petroleum pollutants entering ocean waters. By continuing to strictly enforce rules for driving on the beach, the potential for adverse impacts would be minimized. If vehicular access is lost, and the breach management plan recommends that the breach remain open, then OSV use might be modified or relocated so that the activity can continue. If it is relocated, then there would be no net benefit to water resources because beach areas would remain open to OSV use; if it is closed and not relocated there would be a net benefit.

Expanded use of Egging Island for environmental education would increase visitor use to the island. New facilities would include an expanded soft landing for canoes and kayaks, clearing for a primitive group campsite, and installation of relocatable vault toilets. During construction, minor areas would be disturbed at the campsite and soft landing, exposing soils to erosion with the potential for sedimentation in nearby waters. Motorized boats would be used to convey construction materials and site furnishings to the island and to provide long-term maintenance, increasing emission of petroleum products into the water column and the potential for sediment disturbances in shallow waters caused by accidental propeller contact with the bay bottom and beaching of boats. Long-term use of the site by large groups arriving in non-motorized boats would increase disturbances to the bay bottom at the soft landing and would increase trampling of island vegetation resulting in soil erosion and the potential for sedimentation in nearby waters. Periodic pumping of the vault toilets would have the potential for inadvertent spills of untreated wastewater.

Three new bayside access points would be developed to provide water access to existing backcountry campsites and trails, one of which would provide opportunities for access via motorized vessels. During construction, minor areas would be disturbed at the access points, exposing soils to erosion with the potential for sedimentation in nearby waters. Increased visitor use at the access points, particularly motorized boat access, would increase disturbances to the bay bottom and would increase trampling of island vegetation where boats are launched, resulting in soil erosion and the potential for sedimentation in nearby waters. Addition of motorized boats would increase emission of petroleum products into the water column and the potential for sediment disturbances in shallow waters caused by accidental propeller contact with the bay bottom and mooring/beaching of boats.

On the mainland in Worcester County NPS would seek to acquire from the county two existing points of departure from Chincoteague Bay; the sites would be rehabilitated, as needed, likely including development of a shade shelter and relocatable vault toilet. Rehabilitation could involve disturbance of minor areas at the access points, exposing soils to erosion with the potential for sedimentation in nearby waters. Increased visitor use at the access points, particularly motorized boat access, would increase disturbances to the bay bottom and would increase trampling of vegetation resulting in soil erosion and the potential for sedimentation in nearby waters. Addition of motorized boats would increase emission of petroleum products into the water column and the potential for sediment disturbances in shallow waters caused by accidental propeller contact with the bay bottom and mooring/beaching of boats.

NPS would encourage commercial service operators to provide water transportation to backcountry recreation areas. As more operators become established and new experiences become available, the number of motorized and non-motorized vessels in the backcountry would increase. Additional motorized vessels would have an adverse impact on water resources by increasing emission of petroleum products into the water column and increasing the potential for sediment disturbances in shallow waters caused by accidental propeller contact with the bay bottom and beaching/mooring of boats. Non-motorized vessel impacts would be limited to minor bottom disturbances at soft landings.

**Seashore Operations Management Actions.** Seashore operations would be relocated to a new headquarters complex in the MD 611 corridor near the seashore entrance. NPS would seek a site that is outside of the 100-year floodplain and where wetland impacts could be avoided. Development would entail clearing and grading of the site and construction of administrative offices, a maintenance complex, paved parking, and paved/unpaved outdoor maintenance storage areas. During construction, up to five acres of soil would be disturbed and soils exposed to erosion with the potential for sedimentation in nearby waterways; construction vehicle operations would increase potential for petroleum products to enter runoff from the construction site. Following

construction, paved parking, driveways, outdoor storage areas, and rooftops would result in the potential for slight increases in runoff rates and volumes that could affect local flooding near the new site; NPS staff and maintenance vehicles parked at the facility would increase the potential for petroleum products to enter runoff from the new site. NPS would mitigate potential impacts during and following construction by implementing best management practices for water quality protection and stormwater management. Facility design would ensure that there would be no increase in runoff rates or discharge volume from the site following development due to addition of impervious surfaces. These impacts would be offset by demolition of the existing headquarters complex (exclusive of the environmental education center). During demolition and removal of structures, NPS would mitigate potential impacts to water resources by implementing best management practices for water quality protection.

Approximately 10 acres at the existing seashore headquarters site would be rehabilitated as a shuttle staging area and associated visitor unpaved parking area (for approximately 360 cars). Construction of this facility is common to alternatives 2, 3, and 4 (although where the action would occur would vary slightly withnear the seashore headquarters complex); impacts on water resources are summarized above in section 4.2.3. This facility would remain in use as long as vehicular access to the island is possible; when vehicular access to the island is lost, it would be removed and the site rehabilitated to foster a return to natural conditions, including natural runoff and infiltration characteristics.

When vehicular access to the island is no longer possible, access to the island would shift to a ferry based operation for visitor access and seashore operations at waterfront locations on the mainland and on the island. New mainland facilities near the existing seashore headquarters complex would include a passenger ferry terminal, docking facilities to support seashore operations, administrative offices, maintenance storage facility, paved access roads, unpaved parking area (for up to 700 cars), and unpaved NPS equipment storage yard; new island facilities would include an island terminal facility, docking facilities to support seashore operations, an island shuttle system with shelters and benches. During construction, impacts to water resources could include:

- Dredging, placement of piers, construction of bulkheads, and dredged material disposal would increase turbidity and potentially release contaminants into the water column near the construction site and the dredged material disposal site.
- New development would likely impact shoreline wetland areas.
- Soils on up to ten acres would be exposed to erosion with the potential for sedimentation in nearby waterways.
- Construction vehicle operations would increase potential for petroleum products to enter runoff from the construction site.

Following construction, impacts to water resources could include:

- New development would occur within the floodplain that is functionally dependent upon locations in proximity to water and for which non-floodplain sites would not be a practicable alternative. Placement of fill would be required to construct roads and parking areas and to raise offices and visitor service areas above the level of the 100-year storm.
- Handling solid waste and wastewater in transit from the island to treatment and disposal sites on the mainland would pose a risk of accidental spills that could introduce contaminants directly or indirectly into the water depending on where the spill occurs.
- Visitor vehicles and NPS maintenance and staff vehicles parked at the mainland facility would increase the potential for petroleum products to enter runoff from the site.
- Passenger ferries and NPS maintenance motorized boats would increase emission of petroleum products into the water column and the potential for sediment disturbances in shallow waters at docking facilities caused by accidental propeller contact with the bay bottom.
- Periodic maintenance dredging and dredged material disposal would increase turbidity and potentially release contaminants into the water column near the docking facilities and the dredged material disposal site.

NPS would mitigate potential impacts during and following construction by implementing best management practices for stormwater management and water quality protection. Floodplain impacts would be avoided to the extent practicable; facility design would use nonstructural measures such as unpaved parking areas to reduce flood hazards to human life and property, would ensure that structures and facilities are designed to be consistent with the standards and criteria of the National Flood Insurance Program, and would seek to ensure that there would be no increase in runoff discharge from the site following development. Wetland impacts would be avoided to the extent practicable; impacts that could not be avoided would be minimized; and actions would be taken to compensate for remaining unavoidable adverse wetland impacts by restoring wetlands that might be destroyed or degraded. Wastewater and solid waste handling, and spill prevention and response actions would be implemented to prevent or minimize the release of contaminants. Collectively these actions would result in a potential adverse impact on water resources.

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have impacts on water resources would be the same as those identified for alternative 1.

The overall cumulative impacts would be primarily beneficial because the overall condition of water resources would be improved because of collaborative efforts by

public agencies, local governments, and non-profit partners to reduce pollutant loads from point and non-point sources throughout the coastal bay watersheds. Alternative 3 would add a noticeable increment to the overall beneficial cumulative impact through reduction in stormwater runoff at existing and future seashore facilities. There would also be adverse cumulative impacts associated with pollutant discharges from previously permitted and new construction activities and land uses within the watershed, particularly where they occur outside sewer service areas. Alternative 3 would add an imperceptible adverse increment to the overall adverse cumulative impact due to short term stormwater runoff from active construction sites.

- **Conclusions**

In alternative 3 management actions would have both adverse and beneficial impacts on water resources and would add an imperceptable adverse increment and a noticeable beneficial increment to the total cumulative adverse and beneficial impacts on water resources, respectively.

Adverse impacts would result from potential water contamination associated with continued private motorboat use, OSV use, routine seashore operations and maintenance, and use of chemical treatments to manage vegetation, insect, and wildlife populations, as well as from minor additional groundwater withdrawals for potable water supply. Construction activities associated with replacement of lost or damaged visitor use facilities at more sustainable locations on the island, removal of structures associated with historic land use on the island, and development of new facilities (a seashore entrance station, ATS parking facility, seashore headquarters complex, mainland ferry docking facilities, mainland campground, three bayside water access points, primitive group campsite on Egging Island, and enhancements to two points of departure on the mainland) could have temporary adverse impacts on water resources depending on the nature and location of the actions. New development in the floodplain on the mainland (entrance station, ATS parking (short-term), and ferry docking facilities (long-term)) would have the potential to minimally affect floodplain functions. On the mainland and the island, some wetland areas could be lost or adversely impacted by development of ferry docking facilities along the bay shoreline and a new campground in the MD 611 corridor. Collectively, the adverse impacts would not be significant because of the simultaneous implementation of best management practices and continued actions consistent with NPS management policies protecting water resources, within the context of the overall quality of water resources throughout the seashore.

Beneficial impacts would result from restoring natural surface and groundwater flows by filling remaining mosquito ditches, enhancing hydrologic flows and reducing sedimentation by reducing the aerial coverage of *Phragmites australis* from 5.6 percent to 2 percent, restoring natural surface water flows and removing potential pollutants by rehabilitating island habitats altered by historic land use, reducing shoreline erosion by

stabilizing the mainland shoreline using non-structural measures, promoting public stewardship of water resources by increasing environmental education, reducing nutrient loads to bay waters by improving wastewater treatment, reducing pollutant discharges to bay waters in the north end by reducing boat access and providing restrooms, seeking to establish an oyster sanctuary in Maryland waters, reducing discharges from private structures (oyster houses and hunting blinds) in Virginia waters, supporting conservation partners to establish conservation easements on the mainland within the watersheds of Chincoteague Bay and Newport Bay, acquiring 150 to 200 acres of buffer lands along the bay shoreline, and supporting water quality restoration within the watershed through ongoing partnerships for water resource monitoring, research, and watershed conservation planning. Floodplain functions on the island would be slightly enhanced and flood potentials would be minimally reduced. No wetland resources would be lost and wetland functions and values would be enhanced. Collectively, the beneficial impacts would be significant because they would benefit water resources that are fundamental or related to the seashore, would be long term in duration, and would be readily apparent. Over time, as resources are increasingly focused on addressing issues created by global climate change and enhancing resiliency of saltmarsh habitats and freshwater wetlands, the beneficial impacts on water resources would increase and become more significant. Once vehicular access is lost, rehabilitation and restoration of island habitats would continue at a slower rate due to the complexities of water access operations, although impacts on water resources would continue to be readily apparent and significant.

### 4.2.6 ALTERNATIVE 4 – NATURAL ISLAND EVOLUTION AND A PRIMITIVE ISLAND EXPERIENCE

- **Impact Analysis**

**Coastal Response Management Actions.** Seashore management would allow the island to evolve naturally, maintaining facilities only until they are lost, severely damaged, or become obsolete. Development on the island would become less intensive, with fewer facilities and less impervious surfaces as visitor use facilities are removed. Previous development sites would be rehabilitated to foster a return to natural conditions. Solid waste generated by facility replacement would be properly disposed on the mainland. These actions would benefit water resources by removing fill from the floodplain and by eliminating point and non-point sources of pollutants at parking areas, comfort stations, maintenance facilities, and sites where chemicals subject to accidental spills are handled. Replacement of facilities lost or damaged would be limited to new primitive campsites. Wetlands would be avoided, although all new sites would be within the 100-year floodplain. As in alternative 1, NPS would use best management practices to address stormwater and water quality during and following demolition of damaged facilities and new construction. Permitting requirements would be addressed with the state of Maryland, as appropriate, in advance of any removal and replacement activity. In general, NPS would seek to use non-structural stormwater management and

alternatives in the design and construction of new primitive campsites, including the use of alternatives to asphalt paving to improve groundwater recharge and reduce runoff and erosion. Such measures would benefit water resources by generally slowing sheetflow into adjoining areas and reducing the risk of sedimentation and erosion over the long-term.

As in alternative 3, if bridge access is lost, access would transition to all water access. Beneficial impacts to water resources would result from removal of the remaining visitor use facilities at that time, such as developed campsites and paved roads, as well as removal of all non-NPS vehicles from the island; the potential for most spills and leakage of petroleum products and other contaminants would be eliminated and natural infiltration would be enhanced.

**Natural Resource Management Actions.** Studies would be completed as in alternative 1. Expanded cooperative research would include more basic science and barrier island ecology research into the effects of climate change/sea level rise. New ecological research would provide additional information needed to better understand water quality conditions, trends, and pollutant sources, and would help focus collaboration with other public agencies, academic institutions, and non-governmental organizations to address water quality threats within the watershed.

Natural resource management programs and activities would continue as in alternative 1 although over time programs would expand to address mitigation of human impacts and climate change adaptation. In alternative 4, monitoring key climate drivers and resource conditions would also increase. Collectively these expanded programs would support actions to enhance resiliency of vulnerable resources resulting in a beneficial impact on water resources.

Visitor use impacts on water resources in the north end would be largely eliminated by prohibiting visitor access via motorized vessels. This would largely eliminate emission of petroleum products into the water column in the nearshore area, stop sediment disturbances in shallow waters caused by accidental propeller contact with the bay bottom and by beaching/mooring of boats, and largely eliminate contamination by human waste caused by concentrations of visitors in an area without restroom facilities.

As in alternative 3, NPS would encourage the state of Maryland to establish an oyster sanctuary within the seashore's waters. Oysters, once established would benefit water quality by filtering impurities from bay water.

As in alternative 3, working with Virginia, NPS would assess the legal status of privately owned structures (oyster watch houses and hunting blinds) located within the seashore's Virginia waters and pursue removal of those found to be unauthorized. For authorized structures, NPS would work with Virginia to ensure appropriate wastewater

treatment. Collectively, these actions would reduce discharge of nutrients, pathogens, and other contaminants into bay waters.

As in alternative 3, working with Worcester County, Accomack County, and conservation organizations, NPS would support efforts to protect land (through fee simple purchase or conveyance of conservation easements) within the watersheds of Chincoteague Bay and Newport Bay for conservation and climate change adaptation purposes. Conservation of these lands would benefit water resources by reducing or eliminating existing or future developed land uses that have the potential to discharge contaminants to surface waters or that have or could alter runoff characteristics.

As in alternative 3, NPS would collaborate with partners to expand research to improve understanding of aquatic resources, estuarine ecology, and the effects of human activities on water quality. Research would enable NPS and its partners to better focus water quality management actions to reduce pollutant loads into the coastal bays.

**Cultural Resource Management Actions.** As in alternative 3, implementation of non-structural storm protection measures (such as dune nourishment and planting) to protect the Assateague Beach U.S. Coast Guard Station would not affect water resources.

**Visitor Use and Visitor Experience Management Actions.** New facility development would include development of up to 150 primitive campsites, replacing developed campsites lost to natural coastal processes and the impacts of climate change/sea level rise. Related actions and measures to mitigate impacts on water resources are summarized above under coastal resource management actions for alternative 4.

OSV use on the beach would continue to have the potential to result in petroleum pollutants entering ocean waters. By continuing to strictly enforce rules for driving on the beach, the potential for adverse impacts would be further reduced. If vehicular access is lost, and the breach management plan recommends that the breach remain open, there would be a beneficial impact to water resources because vehicles would be eliminated from part or all of the OSV use area.

**Seashore Operations Management Actions.** As in alternative 3, seashore operations would be based in a new headquarters complex to be developed on the mainland in the MD 611 corridor near the seashore entrance on a non-forested upland site. Proposed actions and related impacts on water resources would be the same as those described for alternative 3 (section 4.3.4).

As in alternative 3, the existing headquarters complex, exclusive of the environmental education center, would be removed. Potential pollutants present at former development sites would be properly disposed. Proposed actions and related impacts

on water resources would be the same as those described for alternative 3 (section 4.3.4).

As in alternative 3, when vehicular access to the island is no longer possible, access to the island would shift to a ferry based operation for visitor access and seashore operations at waterfront locations on the mainland and on the island. Proposed actions and related impacts on water resources would be the same as those described for alternative 3 (section 4.3.4).

The existing maintenance yard in the Maryland Island Developed Area would be removed and the site rehabilitated to foster a return to natural conditions. This would benefit water resources by eliminating impervious surfaces, vehicle storage and use, and storage and handling of petroleum products and other chemicals that could result in inadvertent spills of contaminants that could enter groundwater or nearby wetlands and surface waters.

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have impacts on water resources would be the same as those identified for alternative 1.

The overall cumulative impacts would be primarily beneficial because the overall condition of water resources would be improved because of collaborative efforts by public agencies, local governments, and non-profit partners to reduce pollutant loads from point and non-point sources throughout the coastal bay watersheds. Alternative 4 would add a noticeable increment to the overall beneficial cumulative impact through reduction in stormwater runoff at existing and future seashore facilities. There would also be adverse cumulative impacts associated with pollutant discharges from previously permitted and new construction activities and land uses within the watershed, particularly where they occur outside sewer service areas. Alternative 4 would add an imperceptible adverse increment to the overall adverse cumulative impact due to short term stormwater runoff from active construction sites.

- **Conclusions**

In alternative 4 management actions would have both adverse and beneficial impacts on water resources and would add an imperceptible adverse increment and a noticeable beneficial increment to the total cumulative adverse and beneficial impacts on water resources, respectively.

Adverse impacts would result from potential water contamination associated with continued private motorboat use, OSV use, routine seashore operations and maintenance, and use of chemical treatments to manage vegetation, insect, and wildlife populations, as well as from minor additional groundwater withdrawals for potable

water supply. Construction activities associated with removal of structures associated with historic land use on the island and development of new facilities (a seashore entrance station, ATS parking facility, seashore headquarters complex, mainland ferry docking facilities, and primitive campsites on the island) could have temporary adverse impacts on water resources depending on the nature and location of the actions. New development in the floodplain on the mainland (entrance station, ATS parking (short-term), and ferry docking facilities (long-term)) would have the potential to minimally affect floodplain functions. On the mainland and the island, some wetland areas could be lost or adversely impacted by development of ferry docking facilities along the bay shoreline. Collectively, the adverse impacts would not be significant because of the simultaneous implementation of best management practices and continued actions consistent with NPS management policies protecting water resources, within the context of the overall quality of water resources throughout the seashore.

Beneficial impacts would result from restoring natural surface and groundwater flows by filling remaining mosquito ditches, enhancing hydrologic flows and reducing sedimentation by reducing the aerial coverage of *Phragmites australis* from 5.6 percent to 2 percent, restoring natural surface water flows and removing potential pollutants by rehabilitating island habitats altered by historic land use, reducing shoreline erosion by stabilizing the mainland shoreline using non-structural measures, promoting public stewardship of water resources by increasing environmental education, reducing nutrient loads to bay waters by improving wastewater treatment, reducing pollutant discharges to bay waters in the north end by prohibiting visitor access via motorized vessels, seeking to establish an oyster sanctuary in Maryland waters, reducing discharges from private structures (oyster houses and hunting blinds) in Virginia waters, supporting conservation partners to establish conservation easements on the mainland within the watersheds of Chincoteague Bay and Newport Bay, and supporting water quality restoration within the watershed through ongoing partnerships for water resource monitoring, research, and watershed conservation planning. Floodplain functions on the island would be slightly enhanced and flood potentials would be minimally reduced. No wetland resources would be lost and wetland functions and values would be enhanced. Collectively, the beneficial impacts would be significant because they would benefit water resources that are fundamental or related to the seashore, would be long term in duration, and would be readily apparent. Over time, as resources are increasingly focused on mitigating human impacts and climate change adaptation, the beneficial impacts on water resources would increase and become more significant. Once vehicular access is lost, rehabilitation and restoration of island habitats would continue at a slower rate due to the complexities of water access operations, although impacts on water resources would continue to be readily apparent and significant.

## 4.3 Vegetation

### 4.3.1 METHODOLOGY FOR ANALYZING IMPACTS

Management actions are qualitatively analyzed with respect to their potential to benefit or adversely impact vegetation within the seashore's key habitats, including bayside subtidal and mudflats, saltmarsh, inland wetlands, forest and shrubland, beach and intertidal, and Atlantic subtidal. Analysis also addresses potential impacts to vegetation on the mainland within and adjoining the seashore. Responses to natural coastal processes and the effects of climate change/sea level rise are analyzed to identify potential impacts to vegetation. Actions are identified and analyzed that have the potential to disturb vegetation because of new development, changes in seashore operations, or increased visitor use. Actions are also identified that have the potential to benefit vegetation through research and special studies or through resource management actions aimed at rehabilitating seashore habitats that have been affected by historic land uses and invasive species. For this analysis, it is assumed that during final design for specific projects best management practices (BMPs) would be used to avoid or minimize vegetation disturbances and that all areas experiencing short-term disturbance would be revegetated with native species.

The resource specific context for assessing impacts of the alternatives on vegetation within the seashore's habitats includes:

- Barrier island habitats including dunes, grass and shrublands, freshwater wetlands, maritime forests, and saltmarshes are fundamental to the seashore's purpose and significance.
- Aquatic habitats, including sea grass beds, saltmarshes, sandy shallows, and intertidal flats are fundamental to the seashore's purpose and significance.
- A recent assessment of the seashore's habitats concluded that saltmarsh and forest and shrubland habitats are in degraded condition; inland wetlands, and dunes and grassland habitats are in fair condition; bay subtidal and mudflats, and beach and intertidal habitats are in good condition; and Atlantic subtidal habitat is in very good condition (NPS 2011d).
- Development of 158,386 feet of marsh mosquito ditches at the seashore have severely altered marsh hydrology, disrupting natural flow of tidal water into and out of the seashore's marshes and degrading estuarine water quality by increasing nutrient export from marshes (NPS 2011d).
- *Pragmites australis* has invaded many of the seashore's freshwater shrub wetlands (representing >40% cover on 5.6% of the total area of the seashore (NPS 2011d)), adversely impacting sediment levels and hydrologic flows.
- Introduced horses and sika deer are non-native species that are stressors to seashore vegetation when populations are extreme (NPS 2011d); despite this, sustainable populations of horses and sika deer are desired conditions because visitors highly value the animals as part of the seashore experience.

Furthermore, horses are considered resources that are important to the seashore.

### 4.3.2 ALTERNATIVE 1 – CONTINUATION OF CURRENT MANAGEMENT

- **Impact Analysis**

**Coastal Response Management Actions.** Facilities lost or damaged by natural coastal processes or the effects of climate change/sea level rise would be replaced or repaired, if funding is available. Facilities to be replaced would be moved back from the shoreline and made more sustainable in form and function, at sites that would continue to be protected by investment in dune maintenance. During construction, areas of dunes and grassland, and forest and shrubland would be disturbed. Following construction some areas would be converted to developed facilities, including impervious surfaces (rooftops and paved roads) and pervious paving (parking areas); disturbed areas adjoining finished structures would be revegetated with native grasses, shrubs, and trees. Vegetation losses would be offset to some extent by rehabilitation of previous development sites to foster a return to natural conditions.

Altered sand transport processes at Ocean City Inlet would continue to be mitigated in collaboration with the USACE. This would benefit beach and intertidal vegetation by alleviating sand starvation of the island (from the stabilized inlet) and indirectly helping to create overwash fans and replenish back-barrier marshes. Overwash areas are a dynamic habitat that supports rare island flora, including suitable habitat conditions for the threatened seabeach amaranth (*Amaranths pumilus*).

Dune maintenance to protect visitor facilities and seashore infrastructure in the Maryland Island Developed Area would continue to prevent the natural processes of sand overwash. This would continue to impact adversely vegetation in saltmarshes, dunes and grasslands, and beach and intertidal areas by inhibiting sand replenishment.

**Natural Resource Management Actions.** Existing and new planned monitoring programs and research would benefit all seashore vegetation. Water quality monitoring programs and research would benefit vegetation in bay and subtidal and mudflat areas by enhancing understanding of water quality conditions, trends, and pollutant sources, helping to focus future research and monitoring to address water quality threats within the watershed, and providing the basis for defining and implementing measures to adapt to change and reduce the adverse effects of sea level rise. Continued annual monitoring of seagrass and submerged aquatic vegetation (SAV) would assist with understanding the processes to maintain seagrass within bay subtidal areas. Continued saltmarsh monitoring would provide information on relative saltmarsh elevation needed to interpret changes in saltmarsh vegetation and would contribute to worldwide efforts to monitor sea level rise with by measuring the amount of erosion and accretion on saltmarsh surfaces; together with continued monitoring of marsh birds and saltmarsh

nekton, this would benefit saltmarshes by providing metrics for future condition assessments and could enhance early identification of degradation from climate change. A new baseline groundwater monitoring program would benefit inland wetlands by enhancing understanding of the interrelationships of groundwater and storm overwash/flooding events. Continued monitoring, tracking, and eradication of invasive plant species would benefit vegetation in the seashore's bay subtidal areas and mudflats, saltmarshes, forests and shrubland, inland wetlands, and dunes and grasslands by eliminating species that outcompete native flora and that lower plant diversity in native coastal communities.

NPS would continue scientific and scholarly research focused on developing a better understanding of natural coastal processes and the effects of climate change/sea level rise. Existing partnerships and cooperative relationships with Maryland and Virginia resource management agencies, Worcester County, Accomack County, the Maryland Coastal Bays Program, and various academic institutions and conservation organizations would continue to support ongoing water resource monitoring, research, and watershed conservation planning. These partnerships would continue to benefit vegetation in the seashore's saltmarsh and bay subtidal and mudflat areas by providing information needed to understand better water quality conditions, trends, and pollutant sources, and by facilitating coordinated efforts toward addressing water quality threats within the watershed.

Management actions would continue to restore island habitats altered by historic land use, including removal of six hunting lodges, two private residences, access roads, and water impoundments in the seashore's backcountry. Structures and other impervious surfaces would be removed and sites rehabilitated to foster a return to natural conditions, resulting in a beneficial impact on vegetation in forest and shrubland habitat and dunes and grassland habitat and saltmarsh habitat.

Filling mosquito ditches in the Maryland portion of the seashore would continue. Currently, the seashore has filled about 10 percent of its 48,000 meters of mosquito ditches. Continued ditch restoration would have a beneficial impact on saltmarsh vegetation by helping to restore natural surface and groundwater flows from the island to the bayside and tidal flows in and out of saltmarshes. This would enhance the health and function of saltmarsh vegetation and reduce nutrient export from marshes to bay waters.

*Phragmites australis* removal from saltmarsh, forest and shrubland, inland wetlands, and dunes and grassland would continue using a combination of standard, ground-based control methods in combination with aerial spraying and prescribed fire or mowing as needed in heavily infested areas. These actions would have a beneficial impact on vegetation in these habitats by helping to restore natural sediment levels and hydrologic flows and by eliminating species that outcompete native flora and that lower

plant diversity in native coastal communities. Systemic herbicides would be used that do not bioaccumulate in the aquatic food chain, that exhibit very low toxicity to bacteria, fungi, and animals, and that are rapidly removed from the environment by chemical bonding with soil particles and microbial degradation.

Horse management would continue with the goal of reducing the feral horse population to a sustainable population of 80 to 100 individuals. This would benefit vegetation in saltmarsh habitat, forest and shrubland habitat, inland wetlands habitat, and dunes and grassland habitat by reducing overgrazing, trampled vegetation, addition of nutrients, and loss of sensitive plant species.

Hunting management would continue to reduce the size of the sika deer and white-tailed deer population to levels which would contain impacts on plant species native to the seashore's forest and shrubland habitat. A new hunting monitoring program would enhance management of both sika deer and native white-tailed deer by providing information needed to develop deer density and deer herbivory indices that would inform management decisions aimed at protecting native plant species. If access to the OSV area is lost, access for public hunting could be significantly reduced or lost and deer populations could increase with potential adverse impacts on vegetation. NPS would explore alternative public hunting strategies to manage deer populations.

**Cultural Resource Management Actions.** NPS efforts to identify, manage, and protect cultural resources would continue. When historic structures could no longer be protected from natural coastal processes and the impacts of climate change/sea level rise, they would be demolished and the sites restored to foster a return to natural conditions, resulting in a beneficial impact on vegetation in forest and shrubland habitat and dunes and grassland habitat.

At the Assateague Beach U.S. Coast Guard Station, boat dock repairs would have minor short-term adverse impacts on vegetation in dunes and grassland habitat. Similarly, restoration of electrical service would have minor short-term adverse impacts on vegetation in dunes and grassland habitat associated with trenching for conduit installation from the Tom's Cove recreational beach to the station.

**Visitor Use and Visitor Experience Management Actions.** Confinement of oversand vehicle (OSV) use within the existing designated OSV use area would continue to limit the adverse impact of OSVs on vegetation in dunes and grassland habitat and beach and intertidal habitat by controlling the area subject to compaction, sand displacement, reduced growth of protective foredunes, and erosion typically associated with OSV use. If vehicular access is lost, and the breach management plan recommends that the breach remain open, there would be a beneficial impact to vegetation because vehicles would be eliminated from part or all of the OSV use area.

**Seashore Operations Management Actions.** Based on analysis of historic visitation counts, seashore visitation in Maryland is expected to increase by approximately 8,000 visitors per year as long as there is vehicular access to the seashore. The majority of this growth will be in day-use visitors, as campgrounds are already at capacity most days during the peak summer season. Additional visitors would increase the potential for impacts on vegetation in dune and grassland habitat and beach and intertidal habitat in day-use areas where visitor use is concentrated. Impacts would continue to include trampling, soil compaction, and vegetation loss. NPS would continue to restrict visitor access to habitat areas with designated trails and boardwalks. Some increase in impervious surfaces is likely, with the potential to cause minimal adverse impacts on water quality that could also affect the seashore's habitats. These potential impacts would be mitigated by implementing best management practices for water quality protection.

Development of 20 bedrooms of seasonal housing in Maryland and 17 bedrooms of seasonal housing in Virginia would disturb approximately one to two acres of vegetation during construction and convert approximately one acre to impervious surfaces associated with new buildings, parking, access drives, and walkways. Affected vegetation would likely be composed of a mix of shrubland and landscaped areas adjoining existing seashore facilities.

Withdrawals from wells to meet the daily visitor and NPS employee demands for water would not affect the seashore's vegetation. Water would continue to be drawn from deep groundwater aquifers that do not supply freshwater to the seashore's inland wetlands.

Miscellaneous repairs would be made to the seashore's headquarters complex, visitor use facilities, seashore operations facilities, roads, and trails. Minor soil disturbances would generally affect landscaped areas and mowed grass adjoining existing structures. Following construction, disturbed areas would be revegetated with native grasses, shrubs, and trees.

Routine seashore operations and maintenance activities could result in temporary and localized adverse impacts on vegetation due to trimming of overhanging branches and removal of vines for pedestrian safety. Adverse impacts would be short-term and minimal.

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have the potential to impact vegetation within the seashore include sand transport projects, sediment dredging projects, and actions by the US FWS implementing the comprehensive conservation plan for Chincoteague National Wildlife Refuge. Some seashore vegetation is also affected by actions within the coastal bays watershed that

have the potential to impact water quality (see section 4.2.2) and by land uses within and outside the region that adversely impact air quality, contributing to high levels of ozone and atmospheric deposition of nitrogen at the seashore. Alternative 1 in conjunction with the impacts of these actions would result in a cumulative adverse impact and a cumulative beneficial impact on vegetation. Alternative 1 would contribute an imperceptible adverse increment and an imperceptible beneficial increment to the total cumulative adverse and beneficial impacts.

The overall cumulative impacts on vegetation would be primarily beneficial because of improvements to the overall condition of water resources because of collaborative efforts by public agencies, local governments, and non-profit partners to reduce pollutant loads from point and non-point sources throughout the coastal bay watersheds, and because of national programs to enhance air quality which help to reduce ozone and atmospheric deposition of nitrogen. Alternative 1 would add a noticeable increment to the overall beneficial cumulative impact through continuation of natural resource management actions that restore island habitats altered by historic land use and mosquito ditching, remove invasive *Phragmites australis*, manage horses to reduce impacts to vegetation, and continue to reduce deer populations through managed hunting. There would also be adverse cumulative impacts on vegetation associated with pollutant discharges from previously permitted and new construction activities and land uses within the watershed, particularly where they occur outside sewer service areas, as well as with continued air quality impacts. Alternative 1 would add an imperceptible increment to the overall adverse cumulative impact due to minor vegetation disturbance and clearing for new seashore facilities.

- **Conclusions**

In alternative 1 management actions would have both adverse and beneficial impacts on vegetation and would add an imperceptible adverse increment and a noticeable beneficial increment to the total cumulative adverse and beneficial impacts on vegetation, respectively.

Adverse impacts on seashore vegetation would result from construction of visitor use facilities, including long-term loss of vegetation where new facilities are located and short-term vegetation disturbances during construction in areas adjoining new facilities. Major construction projects would include: new visitor use facilities to replace those lost or damaged by coastal storms or the effects of climate change/sea level rise, new housing (37 bedrooms) for seasonal staff, miscellaneous repairs to the seashore headquarters complex, repairs to the boat dock at the Assateague Beach U.S. Coast Guard Station, and restoration of electrical service to the coast guard station. Adversely affected areas would generally include vegetation in forest and shrubland habitat and dunes and grassland habitat on the island. Other adverse impacts to vegetation would result from: reduced or lost access for public hunting via the OSV route (if access is lost), resulting in potential for increased deer populations and associated overgrazing;

increased visitor use in day-use areas dispersed throughout the Maryland Island Developed Area where adequate land area remains (as long as there is vehicular access) primarily affecting vegetation in beach and intertidal habitat, dunes and grassland habitat, and forest and shrubland habitat; continued use of oversand vehicles within the existing designated OSV use area, affecting vegetation in beach and intertidal habitat and dunes and grassland habitat; continued dune maintenance to protect visitor facilities and seashore infrastructure in the Maryland Island Developed Area that prevents natural overwash processes and inhibits sand replenishment in the seashore's saltmarsh habitat, dunes and grassland habitat, and beach and intertidal habitat; and routine vegetation trimming or removal to protect visitors and seashore facilities. These impacts would not be significant because of the simultaneous implementation of best management practices and continued actions consistent with NPS management policies protecting vegetation, within the context of the overall quality of vegetation throughout the seashore.

Beneficial impacts would result over the long-term from continuation of existing natural resource management actions, including: restoring natural surface and groundwater flows in saltmarsh habitat by filling remaining mosquito ditches; enhancing hydrologic flows and reducing sedimentation in saltmarsh habitat, forest and shrubland habitat, inland wetland habitat, and dunes and grassland habitat by reducing the aerial coverage of *Phragmites australis* from 5.6 percent to 2 percent; fostering a return to natural conditions in areas where historic land uses and construction of new facilities have damaged or resulted in loss of natural habitats by revegetating with native grasses, shrubs, and trees; and monitoring, tracking, and eradication of invasive plants from all seashore habitats and enhancing understanding of conditions, issues, and trends in the seashore's habitats through monitoring, planned special studies, and cooperative relationships with state and local agencies, academic institutions, and conservation organizations. Long-term benefits would also result from: reducing overgrazing, vegetation trampling, addition of nutrients, and loss of sensitive plant species by reducing the feral horse population to a sustainable population of 80 to 100 individuals; protecting native plants from overgrazing by sika deer and native white-tailed deer by continuing to allow hunting and implementing a hunting monitoring program to support more effective deer management; alleviating sand starvation of beach and intertidal habitat caused by the stabilized Ocean City Inlet; and replenishing sand in back-barrier marshes and overwash fan areas in the north end by restoring natural overwash processes. Collectively, the beneficial impacts would not be significant because, while the management actions would benefit vegetation in habitats that are fundamental to the seashore and would address significant threats to fundamental resources, the impacts would be short-term continuing until access is lost and/or resources are no longer available to sustain natural resource management programs and not readily apparent. Once vehicular access is lost, rehabilitation and restoration of island habitats would slow and possibly be curtailed, with the result that the intensity of the beneficial impacts on vegetation would be greatly diminished.

### 4.3.3 IMPACTS COMMON TO ALL ACTION ALTERNATIVES

- **Impact Analysis**

**Coastal Response Management Actions**. As in alternative 1, under alternatives 2, 3, and 4, facilities lost or damaged by natural coastal processes or the effects of climate change/sea level rise would be replaced or repaired, if funding is available, consistent with the underlying principles of each alternative. While the timing and extent to which facilities would continue to be replaced would vary in alternatives 2, 3, and 4, the nature of the impacts on seashore vegetation associated with replacement would be similar to those described for alternative 1 (section 4.2.2).

**Visitor Use and Visitor Experience Management Actions.** Until facilities are lost, NPS would generally increase visitor services within the Maryland Island Developed Area. A few new small structures (with parking) would be added to support commercial services within existing previously disturbed visitor use areas. Construction would disturb approximately one to two acres and convert less than one acre to impervious surfaces associated with new buildings, parking, access drives, and walkways. Affected vegetation would likely be composed of a mix of shrubland and landscaped areas adjoining existing seashore facilities. Following construction, disturbed areas adjoining finished structures would be revegetated with native grasses, shrubs, and trees.

The former visitor center would be rehabilitated as a stand-alone environmental education center. Minor short-term disturbances to landscaped areas adjoining the existing building would occur. No new impervious surface would be added. Following construction, disturbed areas adjoining the finished structure would be revegetated with native grasses, shrubs, and trees.

**Seashore Operations Management Actions.** In collaboration with MD DNR, NPS would develop a new seashore entrance station on the mainland, requiring realignment and widening of MD 611, construction of entrance booths, and addition of employee parking spaces. During construction, road widening and addition of facilities would disturb old field vegetation, weedy vegetation, and mowed grass along MD 611. Construction would disturb several acres and convert approximately one to two acres to impervious surfaces. Affected vegetation would likely be composed of a mix of old field, roadside weedy vegetation, and mowed grass. Following construction, disturbed areas adjoining finished structures would be revegetated with native grasses, shrubs, and trees.

Development of a mainland-based alternative transportation system (ATS) would require development of a shuttle staging area and associated unpaved parking area (for approximately 360 cars) on the mainland and shelters and paved pull-offs at three shuttle stops on the island. During construction, road widening and addition of facilities would disturb old field vegetation, weedy vegetation, and mowed grass in the MD 611 corridor and shrubland or grassland adjoining seashore roads on the island.

Construction would disturb up to ten acres on the mainland and less than one acre on the island, and convert approximately one acre to impervious surfaces and up to nine acres to pervious paving on the mainland and less than 0.25 acre to impervious surfaces on the island. Following construction, disturbed areas adjoining finished structures would be revegetated with native grasses, shrubs, and trees.

Non-structural stabilization of the mainland shoreline near the visitor center would benefit water quality by reducing shoreline erosion and sedimentation of bay waters. Minimal impacts on wetlands would occur where they are present along the shoreline.

### 4.3.4 ALTERNATIVE 2 – CONCENTRATED TRADTIONAL BEACH RECREATION

- **Impact Analysis**

**Coastal Response Management Actions.** Artificial dune fortification and beach nourishment would protect the Maryland Island Developed Area from the effects of natural coastal processes and climate change/sea level rise as long as suitable land base exists and funding is available. The seashore would expand partnerships with the USACE to provide additional sand to provide additional sand to mitigate the erosional forces associated with storms and/or sea level rise. This effort, as well as planting of dunes and fencing to trap sand and exclude grazing horses from the dune, could substantially slow the loss of the developed area to natural coastal processes; however, it would also have an adverse impact on vegetation in saltmarsh habitat, dunes and grassland habitat, and beach and intertidal habitat by interfering with sand transport from the beach to island interiors and depriving back-barrier marshes and overwash fans of sand replenishment.

As land and facilities are lost, they would be rebuilt using more sustainable design within the remaining protected developed area, concentrating visitor use and facilities within a smaller area. To the maximum extent, facilities would be temporary, designed to be removed in advance of coastal storms. Facilities to be replaced would be moved back from the shoreline and made more sustainable in form and function, at sites that would continue to be protected by investment in dune maintenance. During construction, vegetation in areas of dune and grassland habitat and forest and shrubland habitat would be disturbed. Following construction much of the disturbed areas would be converted to developed facilities, including impervious surfaces (rooftops and paved roads) and pervious paving (parking areas); disturbed areas adjoining finished structures would be revegetated with native grasses, shrubs, and trees. Vegetation losses would be offset to some extent by rehabilitation of previous development sites to foster a return to natural conditions. The location, extent, and type of vegetation losses would depend on when and where seashore facilities and infrastructure would be lost and replaced within the developed area.

**Natural Resource Management Actions.** Studies would be completed as in alternative 1. However, the ability of NPS to encourage and support cooperative research would likely decline over time as support for natural resource management would likely be re-directed toward activities protecting recreation opportunities. This would adversely impact efforts to address the challenges of climate change/sea level rise and diminishing detection of emerging threats to the seashore's vegetation. Water quality monitoring, saltmarsh monitoring, groundwater monitoring, and invasive species monitoring would be reduced, resulting in an adverse impact on the seashore's vegetation due to less understanding of issues and trends needed to shape effective resource management and to focus collaboration with other public agencies, academic institutions, and non-governmental organizations to address threats.

Natural resource management programs and activities would continue as in alternative 1 although over time their scope would diminish. Filling mosquito ditches in the Maryland portion of the seashore would likely diminish, reducing benefits to the health and function of saltmarsh habitat and with less benefit to vegetation in bay subtidal and mudflat habitats accruing from bay water quality enhancements due to reducing nutrient export from marshes.

Reduced scope of other natural resource management actions – such as *Phragmites australis* removal, other vegetation restoration and protection, and beach and bayside wetlands protection – would reduce current benefits from those actions to vegetation in all seashore habitats.

Reduced access to the north end by implementing a permit system requiring a docking/mooring pass would benefit vegetation in dunes and grassland habitat and beach and intertidal habitat by reducing visitor use impacts to areas where NPS management actions are underway to restore natural overwash processes.

As in alternative 1, hunting management would continue to reduce the size of the sika deer and white-tailed deer population to levels which would contain impacts on plant species native to the seashore's forest and shrubland habitat, and a new hunting monitoring program would better inform management decisions aimed at protecting native plant species. In alternative 2, the benefits of public hunting to vegetation would be reduced because the OSV area would be smaller, making access to the backcountry more difficult for hunters with the result that fewer deer would be taken annually. If access to the OSV area is lost, no action would be taken to restore it; access for public hunting could be significantly reduced or lost and deer populations could increase with potential adverse impacts on vegetation. NPS would explore alternative public hunting strategies to manage deer populations.

Working with Virginia to ensure appropriate wastewater treatment and disposal at privately owned structures (oyster watch houses and hunting blinds) located within the

seashore's Virginia waters would reduce discharge of nutrients, pathogens, and other contaminants into bay waters, resulting in a beneficial impact to aquatic vegetation in bay subtidal and mudflat habitats.

**Cultural Resource Management Actions.** NPS efforts to identify, manage, and protect cultural resources would continue. When historic structures could no longer be protected from natural coastal processes and the impacts of climate change/sea level rise, they would be demolished and the sites restored to foster a return to natural conditions, resulting in a beneficial impact on vegetation in forest and shrubland habitat and dunes and grassland habitat.

**Visitor Use and Visitor Experience Management Actions.** Oversand vehicle use would be confined within a smaller designated OSV use area (extending south of the Maryland Island Developed Area to approximately KM 23.4). Confinement within this smaller area would further limit the adverse impact of OSVs on vegetation in dunes and grassland habitat and beach and intertidal habitat by reducing the area subject to compaction, sand displacement, reduced growth of protective foredunes, and erosion typically associated with OSV use. If vehicular access is lost, and the breach management plan recommends that the breach remain open, there would be a beneficial impact to vegetation because vehicles would be eliminated from part or all of the OSV use area.

**Seashore Operations Management Actions.** Seashore operations would be based in a rehabilitated headquarters complex in the Maryland Mainland Developed Area. During construction, the area of disturbance would be largely confined to the footprint of existing buildings and parking areas. Some disturbance of adjoining landscaped areas and mowed grass could occur. Following construction, disturbed areas adjoining rehabilitated structures would be revegetated with native grasses, shrubs, and trees.

Approximately 10 acres would be acquired near the existing seashore headquarters complex to develop a shuttle staging area and associated visitor unpaved parking area (for approximately 360 cars). Construction of this facility is common to alternatives 2, 3, and 4, although where the action would occur would vary slightly. Impacts on vegetation are summarized above in section 4.3.3.

Electricity and potable water would be extended to approximately 90 existing campsites. During construction, trenching for underground installation of lines would disturb existing vegetation composed of a mix of grasses and shrubby vegetation in previously disturbed areas along the edges of existing seashore roads. Following construction, disturbed areas would be revegetated with native grasses.

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have impacts on vegetation would be the same as those identified for alternative 1.

Alternative 2 in conjunction with these actions would result in a cumulative adverse impact and a cumulative beneficial impact on vegetation.

The overall cumulative impacts on vegetation would be primarily beneficial because of improvements to the overall condition of water resources because of collaborative efforts by public agencies, local governments, and non-profit partners to reduce pollutant loads from point and non-point sources throughout the coastal bay watersheds, and because of national programs to enhance air quality which help to reduce ozone and atmospheric deposition of nitrogen. Alternative 2 would add a noticeable increment to the overall beneficial cumulative impact through continuation of natural resource management actions that restore island habitats altered by historic land use and mosquito ditching, remove invasive *Phragmites australis*, manage horses to reduce impacts to vegetation, and continue to reduce deer populations through managed hunting. There would also be adverse cumulative impacts on vegetation associated with pollutant discharges from previously permitted and new construction activities and land uses within the watershed, particularly where they occur outside sewer service areas, as well as with continued air quality impacts. Alternative 2 would add a noticeable adverse increment to the overall adverse cumulative impact due to vegetation disturbance and clearing for new seashore facilities.

- **Conclusions**

In alternative 2 management actions would have both adverse and beneficial impacts on vegetation and would add a noticeable adverse increment and a noticeable beneficial increment to the total cumulative adverse and beneficial impacts on vegetation, respectively.

Adverse impacts on seashore vegetation would result from construction of visitor use facilities, including long-term loss of vegetation where new facilities are located and short-term vegetation disturbances during construction in areas adjoining new facilities. Major construction projects would include: new visitor use facilities to replace those lost or damaged by coastal storms or the effects of climate change/sea level rise, new housing for seasonal staff, a new seashore entrance station on the mainland, facilities to support a mainland-based alternative transportation system, a few small structures to support increased visitor services in the island developed area, rehabilitation of the seashore headquarters complex, and extension of electricity and potable water to approximately 90 existing campsites. Adversely affected areas would generally include vegetation in forest and shrubland habitat and dunes and grassland habitat on the island and old field, mowed grass, and landscaped areas around existing seashore buildings on the mainland. Other adverse impacts to vegetation would result from: reduced or lost access for public hunting via the OSV route, resulting in potential increased deer populations and associated overgrazing; increased visitor use in day-use areas within a shrinking protected Maryland Island Developed Area (as long as there is vehicular access), affecting beach and intertidal habitat, dunes and grassland habitat,

and forest and shrubland habitat; continued use of oversand vehicles within a smaller designated OSV use area, affecting vegetation in beach and intertidal habitat and dunes and grassland habitat; enhanced dune maintenance to protect visitor facilities and seashore infrastructure in the Maryland Island Developed Area that would further prevent natural overwash processes and inhibit sand replenishment in the seashore's saltmarsh habitat, dunes and grassland habitat, and beach and intertidal habitat; and routine vegetation trimming or removal to protect visitors and seashore facilities; and continued dune maintenance at the Assateague Beach U.S. Coast Guard Station that prevents natural overwash processes that benefit vegetation in seashore habitats. Over time, the scope of natural resource management programs and activities would diminish. Some of these impacts would not be significant because of the simultaneous implementation of best management practices and continued actions consistent with NPS management policies protecting vegetation, within the context of the overall quality of vegetation throughout the seashore. However, the adverse impacts on vegetation associated with intensification of development within the Maryland Island Development Area and its fortification to withstand the impacts of coastal storms and the effects of climate change/sea level rise would be significant; extensive areas of dunes and grassland habitat and forest and shrubland habitat that are fundamental to the seashore would be lost, and extensive areas of beach and intertidal habitat, dunes and grassland habitat, and saltmarsh habitat that are also fundamental to the seashore would be seriously threatened by sand starvation caused by enhanced fortification that would curtail natural overwash processes.

Beneficial impacts would result over the short-term from continuation of existing natural resource management actions, including: restoring natural surface and groundwater flows in saltmarsh habitat by filling remaining mosquito ditches; enhancing hydrologic flows and reducing sedimentation in saltmarsh habitat, forest and shrubland habitat, inland wetland habitat, and dunes and grassland habitat by reducing the aerial coverage of *Phragmites australis*; fostering a return to natural conditions in areas where historic land uses and construction of new facilities have damaged or resulted in loss of natural habitats by revegetating with native grasses, shrubs, and trees; monitoring, tracking, and eradication of invasive plants from all seashore habitats; enhancing understanding of conditions, issues, and trends in the seashore's habitats through monitoring, planned special studies, and cooperative relationships with state and local agencies, academic institutions, and conservation organizations. Long-term benefits would also result from reducing overgrazing, vegetation trampling, addition of nutrients, and loss of sensitive plant species by reducing the feral horse population to a sustainable population of 80 to 100 individuals; protecting native plants from overgrazing by sika deer and native white-tailed deer by continuing to allow hunting and implementing a hunting monitoring program to support more effective deer management; limiting use of the north end beach; alleviating sand starvation of beach and intertidal habitat caused by the stabilized Ocean City Inlet; and replenishing sand in back-barrier marshes and overwash fan areas in the north end by restoring natural

overwash processes. Collectively, the beneficial impacts would not be significant because, while the management actions would benefit vegetation in habitats that are fundamental to the seashore and would address significant threats to fundamental resources, the impacts would be short-term (continuing until access is lost and/or resources are no longer available to sustain natural resource management programs) and probably not readily apparent, depending upon when existing natural resource management programs are diminished or curtailed. Once vehicular access is lost, rehabilitation and restoration of island habitats would slow and possibly be curtailed, with the result that the intensity of the beneficial impacts on vegetation would be greatly diminished.

### 4.3.5 ALTERNATIVE 3 – SUSTAINABLE RECREATION AND CLIMATE CHANGE ADAPTATION (NPS PREFERRED ALTERNATIVE)

- **Impact Analysis**

**Coastal Response Management Actions.** Seashore management would allow the island to evolve naturally, relocating and designing new facilities to be more sustainable. The seashore would no longer work with the USACE to provide additional sand to provide additional sand to mitigate the erosional forces associated with storms and/or sea level rise. No new investments would be made in dune fortification through planting and fencing installation. Over time, natural overwash would resume throughout the developed area. This would benefit vegetation in beach and intertidal habitat, dunes and grassland habitat, and saltmarsh habitat by restoring sand transport from the beach to the island interiors, creating overwash fans and replenishing sand in back-barrier marshes.

Visitor use infrastructure would evolve to more sustainable designs and likely shift to new, more stable locations initially on the island; over time development on the island would become less intensive, with fewer facilities and less impervious surfaces as visitor use facilities are slowly moved to the mainland. To the maximum extent, facilities would be temporary, designed to be removed in advance of coastal storms. Facilities lost or damaged by natural coastal processes or the effects of climate change/sea level rise would be replaced or repaired, if funding is available, at sites further from the shoreline at sites that do not require continued investment in dune maintenance where they can be made more sustainable in form and function. Previous development sites would be rehabilitated to foster a return to natural conditions. During construction, vegetation in dunes grassland habitat and forest and shrubland habitat would be disturbed. Following construction much of the disturbed areas would be converted to more primitive less extensive developed facilities with less impervious surfaces (rooftops and paved roads) and pervious paving (parking areas) when compared to the facilities being replaced. Disturbed areas adjoining finished structures would be revegetated with native grasses, shrubs, and trees. Vegetation losses would be largely offset by rehabilitation of previous development sites to foster a return to natural

conditions. The location, extent, and type of vegetation losses would depend on when and where seashore facilities and infrastructure would be lost and replaced.

If bridge access is lost, access would transition to all water access. Beneficial impacts to vegetation in dunes and grassland habitat and forest and shrubland habitat would result from removal of 150 campsites, other visitor facilities, paved roads, and the NPS maintenance yard and subsequent management to foster a return to natural condition.

**Natural Resource Management Actions.** Studies would be completed as in alternative 1. Existing and new planned monitoring programs and research would benefit vegetation in all seashore habitats. Cooperative research would expand, accelerating growth in the understanding of seashore resources and ecological processes. Data from an expanded monitoring network, as well as new ecological research, would provide a significant increase in information needed to understand better vegetation conditions, trends, and threats.

Natural resource management programs and activities would continue as in alternative 1 although over time programs would expand to address issues created by global climate change. In alternative 3, actions would generally seek to enhance resiliency of saltmarshes and inland wetlands resulting in a beneficial impact on vegetation.

Reduced access to the north end by implementing a permit system requiring a docking/mooring pass would benefit vegetation in dunes and grassland habitat and beach and intertidal habitat by reducing visitor use impacts to areas where NPS management actions are underway to restore natural overwash processes.

As in alternative 1, hunting management would continue to reduce the size of the sika deer and white-tailed deer population to levels which would contain impacts on plant species native to the seashore's forest and shrubland habitat, and a new hunting monitoring program would better inform management decisions aimed at protecting native plant species. In alternative 3, if access to the OSV area is lost, consideration would be given to modifying the OSV route or relocating it to another more suitable location, thereby maintaining public access for hunting and its beneficial impacts to vegetation by reducing deer populations. Over time, however, it is possible that access for public hunting could be significantly reduced or lost and deer populations could increase with potential adverse impacts on vegetation.

NPS would explore alternative public hunting strategies to manage deer populations.

Working with Virginia, NPS would assess the legal status of privately owned structures (oyster watch houses and hunting blinds) located within the seashore's Virginia waters and pursue removal of those found to be unauthorized. For authorized structures, NPS would work with Virginia to ensure appropriate wastewater treatment. Collectively,

these actions would reduce discharge of nutrients, pathogens, and other contaminants into bay waters resulting in a beneficial impact on aquatic vegetation in bay subtidal and mudflat habitats.

Working with Worcester County, Accomack County, and conservation organizations, NPS would support efforts to protect land (through fee simple purchase or conveyance of conservation easements) within the watersheds of Chincoteague Bay and Newport Bay for conservation and climate change adaptation purposes. Conservation of these lands would benefit vegetation in a variety of mainland habitats by protecting them from future loss to developed land uses.

NPS would collaborate with its conservation partners to acquire approximately 150 to 200 acres of buffer lands adjoining the one to three new points of departure on the Chincoteague Bay mainland in Worcester County. Land conservation would permanently protect these lands from loss to developed land uses; long-term management would facilitate return to natural conditions, as appropriate, with beneficial impacts to vegetation in a variety of mainland habitats, particularly saltmarsh habitat along the bayshore.

**Cultural Resource Management Actions.** Implementation of non-structural storm protection measures (such as dune nourishment and planting) to protect the Assateague Beach U.S. Coast Guard Station would continue to prevent natural processes of sand overwash in the station vicinity. This would continue to impact adversely vegetation in dunes and grassland habitat and beach and intertidal habitat by inhibiting sand replenishment.

**Visitor Use and Visitor Experience Management Actions.** Once camping facilities are no longer sustainable in the Maryland Island Developed Area or when vehicular access to the island is lost, NPS would collaborate with MD DNR to develop a new campground on the mainland. Facilities would be replaced on an approximate 175-acre site in the MD 611 corridor near the existing seashore headquarters complex. Campground development would entail minimal clearing and grading of the site, paved road construction, utility installations, development of 150 campsites (including approximately 40 sites with paved pads/pull-throughs), and construction of comfort facilities and shower buildings, an amphitheater, sewage dump station, and an entrance station with parking). Construction would disturb a portion of the campground site, depending upon the final program and site design, likely adversely impacting vegetation in a mix of old field habitat and forest habitat. Site selection and design would seek to avoid impacts to wetlands. Some of the disturbed area would be converted to developed campground uses. Disturbed areas not needed for facilities would be revegetated with native grasses, shrubs, and trees to foster a return to natural conditions.

As in alternative 1, confinement of oversand vehicle use within the existing designated OSV use area would continue to limit the adverse impact of OSVs on vegetation in dunes and grassland habitat and beach and intertidal habitat by controlling the area subject to compaction, sand displacement, reduced growth of protective foredunes, and erosion typically associated with OSV use. If vehicular access is lost, and the breach management plan recommends that the breach remain open, there would be a beneficial impact to vegetation because vehicles would be eliminated from part or all of the OSV use area.

Expanded use of Egging Island for environmental education would increase visitor use to the island. New facilities would include an expanded soft landing for canoes and kayaks, clearing for a primitive group campsite, and installation of relocatable vault toilets. Minor areas would be cleared at the campsite and soft landing site, adversely impacting vegetation in bay subtidal and mudflat habitat and/or saltmarsh habitat at the island shore and forest and shrubland habitat and/or dune and grassland habitat at the campsite. Long-term use of the site by large groups arriving in non-motorized boats would increase disturbances to the bay bottom at the soft landing and would increase trampling of island vegetation in the campsite vicinity resulting in potential loss of vegetation.

Three new bayside access points would be developed to provide water access to existing backcountry campsites and trails, one of which would provide opportunities for access via motorized vessels. Minor areas would be cleared at each access site, adversely impacting aquatic vegetation in bay subtidal and mudflat habitat and/or saltmarsh habitat on the bayshore. Long-term use of the site by large groups arriving in non-motorized boats would increase disturbances to the bay bottom at the soft landing and would increase trampling of island vegetation in the campsite vicinity resulting in potential loss of vegetation.

On the mainland in Worcester County NPS would seek to acquire from the county two existing points of departure from Chincoteague Bay; the sites would be rehabilitated, as needed, likely including development of a shade shelter and relocatable vault toilet. Rehabilitation could involve disturbance of minor areas at the access points that were previously disturbed when the facility was originally developed. Increased visitor use at the access points, particularly motorized boat access, would increase disturbances to the bay bottom and would increase trampling of vegetation along the mainland shore where boats are launched.

**Seashore Operations Management Actions.** Seashore operations would be relocated to a new headquarters complex in the MD 611 corridor near the seashore entrance. Development would entail clearing and grading of the site and construction of administrative offices, a maintenance complex, paved parking, and paved/unpaved outdoor maintenance storage areas. Construction would disturb up to five acres of old

field and/or upland forest, and convert approximately four acres to impervious surfaces. Following construction, disturbed areas adjoining finished structures would be revegetated with native grasses, shrubs, and trees.

Approximately 10 acres at the existing seashore headquarters site would be rehabilitated as a shuttle staging area and associated visitor unpaved parking area (for approximately 360 cars). Construction of this facility is common to alternatives 2, 3, and 4, although where the action would occur would vary slightly. Impacts on seashore vegetation are summarized above in section 4.3.3. This facility would remain in use as long as vehicular access to the island is possible; when vehicular access to the island is lost, it would be removed and the site rehabilitated to foster a return to natural conditions.

When vehicular access to the island is no longer possible, access to the island would shift to a ferry based operation for visitor access and seashore operations at waterfront locations on the mainland and on the island. New mainland facilities near the existing seashore headquarters complex would include a passenger ferry terminal, docking facilities to support seashore operations, administrative offices, maintenance storage facility, paved access roads, unpaved parking area (for up to 700 cars), and unpaved NPS equipment storage yard; new island facilities would include an island terminal facility, docking facilities to support seashore operations, an island shuttle system with shelters and benches. Development would entail clearing and grading of sites on the mainland and the island. On the mainland, construction would disturb vegetation on up to ten acres in old field and/or upland forest habitats. On the island, construction would disturb up to two acres, likely composed of a mix of vegetation in previously developed land, dunes and grassland habitat, and forest and shrubland habitat. Along the shore on the mainland and the island, construction of docking facilities would disturb vegetation in saltmarsh habitat and/or bay subtidal and mudflat habitat. Following construction, disturbed areas adjoining finished structures would be revegetated with native grasses, shrubs, and trees, as appropriate.

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have impacts on vegetation would be the same as those identified for alternative 1.

The overall cumulative impacts on vegetation would be primarily beneficial because of improvements to the overall condition of water resources because of collaborative efforts by public agencies, local governments, and non-profit partners to reduce pollutant loads from point and non-point sources throughout the coastal bay watersheds, and because of national programs to enhance air quality which help to reduce ozone and atmospheric deposition of nitrogen. Alternative 3 would add an appreciable increment to the overall beneficial cumulative impact through expansion of natural resource management actions that restore island habitats altered by historic

land use and mosquito ditching, remove invasive *Phragmites australis*, manage horses to reduce impacts to vegetation, continue to reduce deer populations through managed hunting, and – once access is lost – removal of visitor facilities and reduced visitation. There would also be adverse cumulative impacts on vegetation associated with pollutant discharges from previously permitted and new construction activities and land uses within the watershed, particularly where they occur outside sewer service areas, as well as with continued air quality impacts. Alternative 3 would add a noticeable adverse increment to the overall adverse cumulative impact due to vegetation disturbance and clearing for new seashore facilities.

- **Conclusions**

In alternative 3 management actions would have both adverse and beneficial impacts on vegetation and would add a noticeable adverse increment and an appreciable beneficial increment to the total cumulative adverse and beneficial impacts on vegetation, respectively.

Adverse impacts on seashore vegetation would result from construction of visitor use facilities, including long-term loss of vegetation where new facilities are located and short-term vegetation disturbances during construction in areas adjoining new facilities. Major construction projects would include: new visitor use facilities to replace those lost or damaged by coastal storms or the effects of climate change/sea level rise, new housing for seasonal staff, a new seashore entrance station on the mainland, facilities to support a mainland-based alternative transportation system, a few small structures to support increased visitor services in the island developed area, construction of a new seashore headquarters complex, repairs to the boat dock at the Assateague Beach U.S. Coast Guard Station, restoration of electrical service to the coast guard station, development of docking facilities on the mainland and the island to support water-based visitor access and seashore operations, and construction of a new campground on the mainland with approximately 150 campsites. Adversely affected areas would generally include vegetation in forest and shrubland habitat and dunes and grassland habitat on the island and old field, mowed grass, landscaped areas around existing seashore buildings, and upland forest on the mainland. Other adverse impacts to vegetation would result from: increased visitor use in day-use areas dispersed throughout the Maryland Island Developed Area (as long as there is vehicular access) at existing sites where adequate land area remains or at more sustainable sites, primarily affecting vegetation in beach and intertidal habitat, dunes and grassland habitat, and forest and shrubland habitat; continued use of oversand vehicles within the existing designated OSV use area, affecting vegetation in beach and intertidal habitat and dunes and grassland habitat; continued dune maintenance at the Assateague Beach U.S. Coast Guard Station that prevents natural overwash processes that benefit vegetation in seashore habitats; and routine vegetation trimming or removal to protect visitors and seashore facilities. These impacts would not be significant because of the simultaneous implementation of best management practices and continued actions consistent with

NPS management policies protecting vegetation, within the context of the overall quality of vegetation throughout the seashore.

Beneficial impacts would result over the long-term from continuation and expansion of existing natural resource management actions, including: restoring natural surface and groundwater flows in saltmarsh habitat by filling remaining mosquito ditches; enhancing hydrologic flows and reducing sedimentation in saltmarsh habitat, forest and shrubland habitat, inland wetland habitat, and dunes and grassland habitat by reducing the aerial coverage of *Phragmites australis* from 5.6 percent to 2 percent; fostering a return to natural conditions in areas where historic land uses and construction of new facilities have damaged or resulted in loss of natural habitats by revegetating with native grasses, shrubs, and trees; monitoring, tracking, and eradication of invasive plants from all seashore habitats; enhancing understanding of conditions, issues, and trends in the seashore's habitats through expanded monitoring, additional special studies, and expanded cooperative relationships with state and local agencies, academic institutions, and conservation organizations. Long-term benefits would also result from reducing overgrazing, vegetation trampling, addition of nutrients, and loss of sensitive plant species by reducing the feral horse population to a sustainable population of 80 to 100 individuals; protecting native plants from overgrazing by sika deer and native white-tailed deer by continuing to allow hunting and implementing a hunting monitoring program to support more effective deer management; reducing visitor use impacts on vegetation in the north end by reducing visitor access by water; alleviating sand starvation of beach and intertidal habitat caused by the stabilized Ocean City Inlet; replenishing sand in back-barrier marshes and overwash fan areas in the north end by restoring natural overwash processes; collaboration with the states to ensure adequate wastewater treatment at oyster watch houses and hunting blinds; supporting conservation partners to establish conservation easements on the mainland within the watersheds of Chincoteague Bay and Newport Bay; collaboration to acquire and protect 150 to 200 acres of buffer lands adjoining one to three new points of departure on the mainland in Worcester County; and, once vehicular access is lost, removal of visitor use facilities from the island and rehabilitation of sites to foster a return to natural conditions. Collectively, the beneficial impacts would be significant because they would benefit vegetation in habitats that are fundamental to the seashore, would address significant threats to fundamental resources, would be long term in duration, and would be readily apparent. Once vehicular access is lost, rehabilitation and restoration of island habitats would continue at a slower rate due to the complexities of water access operations, although impacts on vegetation would continue to be readily apparent and significant.

### 4.3.6 ALTERNATIVE 4 – NATURAL ISLAND EVOLUTION AND A PRIMITIVE ISLAND EXPERIENCE

- **Impact Analysis**

**Coastal Response Management Actions.** Seashore management would allow the island to evolve naturally, maintaining facilities only until they are lost, severely damaged, or become obsolete. As in alternative 3, the seashore would no longer work with the USACE to provide additional sand to provide additional sand to mitigate the erosional forces associated with storms and/or sea level rise. No new investments would be made in dune fortification through planting and fencing installation. Over time, natural overwash would resume throughout the developed area. This would benefit vegetation in beach and intertidal habitat, dunes and grassland habitat, and saltmarsh habitat by restoring sand transport from the beach to the island interiors, creating overwash fans and replenishing sand in back-barrier marshes.

Development on the island would become less intensive, with fewer facilities and less impervious surfaces as visitor use facilities are removed. Previous development sites would be rehabilitated to foster a return to natural conditions. Replacement of facilities lost or damaged would be limited to new primitive campsites. During construction, vegetation in areas of dune and grassland habitat and forest and shrubland habitat would be disturbed. Following construction, much of the disturbed areas would be converted to more primitive less extensive developed facilities with very little impervious surfaces; disturbed areas adjoining finished structures would be revegetated with native grasses, shrubs, and trees. Vegetation losses would be largely offset by rehabilitation of previous development sites to foster a return to natural conditions. The location, extent, and type of vegetation losses would depend on when and where seashore facilities and infrastructure would be lost and replaced.

As in alternative 3, if bridge access is lost, access would transition to all water access. Beneficial impacts to vegetation in dunes and grassland habitat and forest and shrubland habitat would result from removal of 150 campsites, other visitor facilities, paved roads, and the NPS maintenance yard and subsequent management to foster a return to natural condition.

**Natural Resource Management Actions.** Natural resource management programs and activities would continue as in alternative 1 although over time programs would expand to address mitigation of human impacts and climate change adaptation. In alternative 4, monitoring key climate drivers and resource conditions would increase. Collectively these expanded programs would support actions to enhance resiliency of vulnerable resources resulting in a beneficial impact on the seashore's vegetation.

Visitor use impacts on vegetation resources in the north end would be largely eliminated by prohibiting boat-in visitor use. This would have a beneficial impact on

vegetation because few visitors would make the trip to the north end via non-motorized boats or hiking, therey reducing the potential for vegetation disturbance.

Expanded cooperative research would include more basic science and barrier island ecology research. New ecological research, would provide additional in information needed to better understand habitat conditions, trends, and pollutant sources, and would help focus collaboration with other public agencies, academic institutions, and non-governmental organizations.

As in alternative 1, hunting management would continue to reduce the size of the sika deer and white-tailed deer population to levels which would contain impacts on plant species native to the seashore's forest and shrubland habitat, and a new hunting monitoring program would better inform management decisions aimed at protecting native plant species. In alternative 4, if access to the OSV area is lost, no action would be taken to restore it; access for public hunting could be significantly reduced or lost and deer populations could increase with potential adverse impacts on vegetation. NPS would explore alternative public hunting strategies to manage deer populations.

As in alternative 3, working with Virginia, NPS would assess the legal status of privately owned structures (oyster watch houses and hunting blinds) located within the seashore's Virginia waters and pursue removal of those found to be unauthorized. For authorized structures, NPS would work with Virginia to ensure appropriate wastewater treatment. Collectively, these actions would reduce discharge of nutrients, pathogens, and other contaminants into bay waters resulting in a beneficial impact on aquatic vegetation in bay subtidal and mudflat habitats.

As in alternative 3, working with Worcester County, Accomack County, and conservation organizations, NPS would support efforts to protect land (through fee simple purchase or conveyance of conservation easements) within the watersheds of Chincoteague Bay and Newport Bay for conservation and climate change adaptation purposes. Conservation of these lands would benefit vegetation in a variety of mainland habitats by protecting them from future loss to developed land uses.

**Cultural Resource Management Actions.** As in alternative 3, implementation of non-structural storm protection measures (such as dune nourishment and planting) to protect the Assateague Beach U.S. Coast Guard Station would continue to prevent natural processes of sand overwash in the station vicinity. This would continue to impact adversely vegetation in dunes and grassland habitat and beach and intertidal habitat by inhibiting sand replenishment.

**Visitor Use and Visitor Experience Management Actions.** New facility development would include development of up to 150 primitive campsites, replacing developed campsites lost to natural coastal processes and the impacts of climate change/sea level

rise. Related actions and measures to mitigate impacts on vegetation are summarized above under coastal resource management actions for alternative 4.

As in alternative 1, confinement of oversand vehicle use within the existing designated OSV use area would continue to limit the adverse impact of OSVs on vegetation in dunes and grassland habitat and beach and intertidal habitat by controlling the area subject to compaction, sand displacement, reduced growth of protective foredunes, and erosion typically associated with OSV use. If vehicular access is lost, and the breach management plan recommends that the breach remain open, there would be a beneficial impact to vegetation because vehicles would be eliminated from part or all of the OSV use area.

**Seashore Operations Management Actions.** As in alternative 3, seashore operations would be based in a new headquarters complex to be developed on the mainland in the MD 611 corridor near the seashore entrance on a non-forested upland site. Proposed actions and related impacts on vegetation in old field habitat and upland forest habitat on the mainland would be the same as those described for alternative 3 (section 4.3.5).

Approximately 10 acres at the existing seashore headquarters site would be rehabilitated as a shuttle staging area and associated visitor unpaved parking area (for approximately 360 cars). Construction of this facility is common to alternatives 2, 3, and 4, although where the action would occur would vary slightly. Impacts on seashore vegetation are summarized above in section 4.3.3. As in alternative 3, this facility would remain in use as long as vehicular access to the island is possible; when vehicular access to the island is lost, it would be removed and the site rehabilitated to foster a return to natural conditions.

As in alternative 3, when vehicular access to the island is no longer possible, access to the island would shift to a ferry based operation for visitor access and seashore operations at waterfront locations on the mainland and on the island. Proposed actions and related impacts on the seashore's vegetation would be the same as those described for alternative 3 (section 4.3.5).

The existing maintenance yard in the Maryland Island Developed Area would be removed and the site rehabilitated to foster a return to natural conditions.

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have impacts on vegetation would be the same as those identified for alternative 1.

The overall cumulative impacts on vegetation would be primarily beneficial because of improvements to the overall condition of water resources because of collaborative efforts by public agencies, local governments, and non-profit partners to reduce

pollutant loads from point and non-point sources throughout the coastal bay watersheds, and because of national programs to enhance air quality which help to reduce ozone and atmospheric deposition of nitrogen. Alternative 4 would add an appreciable increment to the overall beneficial cumulative impact through expansion of natural resource management actions that restore island habitats altered by historic land use and mosquito ditching, remove invasive *Phragmites australis*, manage horses to reduce impacts to vegetation, continue to reduce deer populations through managed hunting and – once access is lost – removal of visitor facilities and reduced visitation. There would also be adverse cumulative impacts on vegetation associated with pollutant discharges from previously permitted and new construction activities and land uses within the watershed, particularly where they occur outside sewer service areas, as well as with continued air quality impacts. Alternative 4 would add a noticeable adverse increment to the overall adverse cumulative impact due to vegetation disturbance and clearing for new seashore facilities.

- **Conclusions**

In alternative 4 management actions would have both adverse and beneficial impacts on vegetation and would add a noticeable adverse increment and an appreciable beneficial increment to the total cumulative adverse and beneficial impacts on vegetation, respectively.

Adverse impacts on seashore vegetation would result from construction of visitor use facilities, including long-term loss of vegetation where new facilities are located and short-term vegetation disturbances during construction in areas adjoining new facilities. Major construction projects would include: 150 primitive campsites on the island (to replace existing developed campgrounds once they are lost or severely damaged), a new seashore entrance station on the mainland, facilities to support a mainland-based alternative transportation system, a few small structures to support increased visitor services in the island developed area (until developed facilities are lost), construction of a new seashore headquarters complex, repairs to the boat dock at the Assateague Beach U.S. Coast Guard Station, restoration of electrical service to the coast guard station, and development of docking facilities on the mainland and the island to support water-based visitor access and seashore operations. Adversely affected areas would generally include vegetation in forest and shrubland habitat and dunes and grassland habitat on the island and old field, mowed grass, landscaped areas around existing seashore buildings, and upland forest on the mainland. Other adverse impacts to vegetation would result from: reduced or lost access for public hunting via the OSV route (if access is lost), resulting in potential for increased deer populations and associated overgrazing; increased visitor use in day-use areas dispersed throughout the Maryland Island Developed Area (as long as there is vehicular access) at existing sites where adequate land area remains or at more sustainable sites, primarily affecting vegetation in beach and intertidal habitat, dunes and grassland habitat, and forest and shrubland habitat; continued use of oversand vehicles within the existing designated

OSV use area, affecting vegetation in beach and intertidal habitat and dunes and grassland habitat; continued dune maintenance at the Assateague Beach U.S. Coast Guard Station that prevents natural overwash processes that benefit vegetation in seashore habitats; and routine vegetation trimming or removal to protect visitors and seashore facilities. These impacts would not be significant because of the simultaneous implementation of best management practices and continued actions consistent with NPS management policies protecting vegetation, within the context of the overall quality of vegetation throughout the seashore.

Beneficial impacts would result over the long-term from continuation and expansion of existing natural resource management actions, including: restoring natural surface and groundwater flows in saltmarsh habitat by filling remaining mosquito ditches; enhancing hydrologic flows and reducing sedimentation in saltmarsh habitat, forest and shrubland habitat, inland wetland habitat, and dunes and grassland habitat by reducing the aerial coverage of *Phragmites australis* from 5.6 percent to 2 percent; fostering a return to natural conditions in areas where historic land uses and construction of new facilities have damaged or resulted in loss of native vegetation with native grasses, shrubs, and trees; monitoring, tracking, and eradication of invasive plants from all seashore habitats; and enhancing understanding of conditions, issues, and trends in the seashore's habitats through expanded monitoring, additional special studies, and expanded cooperative relationships with state and local agencies, academic institutions, and conservation organizations. Long-term benefits would also result from reducing overgrazing, vegetation trampling, addition of nutrients, and loss of sensitive plant species by reducing the feral horse population to a sustainable population of 80 to 100 individuals; protecting native plants from overgrazing by sika deer and native white-tailed deer by continuing to allow hunting and implementing a hunting monitoring program to support more effective deer management; reducing visitor use impacts on vegetation in the north end by reducing visitor access by water; alleviating sand starvation of beach and intertidal habitat caused by the stabilized Ocean City Inlet; replenishing sand in back-barrier marshes and overwash fan areas in the north end by restoring natural overwash processes; collaboration with the states to ensure adequate wastewater treatment at oyster watch houses and hunting blinds; supporting conservation partners to establish conservation easements on the mainland within the watersheds of Chincoteague Bay and Newport Bay; and, as facilities are lost or severely damaged, removal of visitor use facilities from the island and rehabilitation of sites to foster a return to natural conditions. Collectively, the beneficial impacts would be significant because they would benefit vegetation in habitats that are fundamental to the seashore, would address significant threats to fundamental resources, would be long term in duration, and would be readily apparent. Once vehicular access is lost, rehabilitation and restoration of island habitats would continue at a slower rate due to the complexities of water access operations, although impacts on vegetation would continue to be readily apparent and significant.

## 4.4 Wildlife

### 4.4.1 METHODOLOGY FOR ANALYZING IMPACTS

Management actions are qualitatively analyzed with respect to their potential to benefit or adversely impact wildlife within the seashore's key habitats, including bayside subtidal and mudflats, saltmarsh, inland wetlands, forest and shrubland, beach and intertidal, and Atlantic subtidal. Analysis also addresses potential impacts to wildlife on the mainland within and adjoining the seashore. Responses to natural coastal processes and the effects of climate change/sea level rise are analyzed to identify potential impacts to wildlife. Actions are identified and analyzed that have the potential to disturb wildlife because of new development, changes in seashore operations, or increased visitor use. Actions are also identified that have the potential to benefit wildlife through research and special studies or through resource management actions aimed at rehabilitating seashore habitats that have been affected by historic land uses and invasive species. For this analysis, it is assumed that during final design for specific projects, best management practices (BMPs) would be used to avoid or minimize wildlife disturbances and that all areas experiencing short-term disturbance would be revegetated with native species.

The resource specific context for assessing impacts of the alternatives on wildlife within the seashore's habitats includes:

- Barrier island habitats including beaches, intertidal areas, dunes, grass and shrublands, freshwater wetlands, maritime forests, and saltmarshes provide habitat for a multitude of specialized plant and animal species – such as abundant and diverse populations of migratory birds – that are fundamental to the seashore's purpose and significance.
- Aquatic habitats including sea grass beds, saltmarshes, sandy shallows, and intertidal flats provide habitat for a multitude of marine life, ranging from small sedentary plants and invertebrates to large ocean-going marine mammals that are fundamental to the seashore's purpose and significance.
- A recent assessment of the seashore's habitats concluded that saltmarsh, and forest and shrubland habitats are in degraded condition; inland wetlands, and dunes and grassland habitats are in fair condition; bay subtidal and mudflats, and beach and intertidal habitats are in good condition; and Atlantic subtidal habitat is in very good condition (NPS 2011d).
- Management actions at the seashore over the past eighty years have changed the naturally dynamic geomorphological processes of Assateague Island, resulting in long-term impediments to natural island overwash processes with ensuing impacts to the seashore's habitats (NPS 2011d).
- Development of 158,386 feet of marsh mosquito ditches at the seashore have severely altered marsh hydrology, disrupting natural flow of tidal water into

and out of the seashore's marshes and degrading estuarine water quality by increasing nutrient export from marshes (NPS 2011d).

- *Pragmites australis* has invaded many of the seashore's freshwater shrub wetlands (representing >40% cover on 5.6% of the total area of the seashore (NPS 2011d)), adversely impacting sediment levels and hydrologic flows.
- Significant impacts to the seashore's geomorphology and wildlife habitats include the hard stabilization of the Ocean City Inlet, the construction of an artificial protective dune along much of the island in 1962 following a major coastal storm, and the creation of an emergency storm berm at the north end of the island in 1998 after two storms threatened to breach the island (NPS 2011d). To mitigate the impacts, NPS and the USACE have been engaged in a long-term mechanical sand bypass project to alleviate sand starvation of the island from the stabilized inlet, thereby preventing unnatural, accelerated erosion and roll over.
- Introduced horses and sika deer are non-native species that are stressors to seashore vegetation and wildlife when populations are extreme (NPS 2011d); despite this, sustainable populations of horses and sika deer are desired conditions because visitors highly value the animals as part of the seashore experience. Furthermore, horses are considered resources that are important to the seashore.

### 4.4.2 ALTERNATIVE 1 – CONTINUATION OF CURRENT MANAGEMENT

- **Impact Analysis**

**Coastal Response Management Actions.** Dune maintenance to protect visitor facilities and seashore infrastructure in the Maryland Island Developed Area would continue to prevent the natural processes of sand overwash. This would continue to impact adversely wildlife inhabiting the beach, intertidal area, dunes, grasslands, and saltmarshes in the developed area by interfering with sand transport from the beach to island interiors and depriving back-barrier marshes and overwash fans of sand replenishment needed to sustain habitats.

Facilities lost or damaged by natural coastal processes or the effects of climate change/sea level rise would be replaced or repaired, if funding is available. Facilities to be replaced would be moved back from the shoreline and made more sustainable in form and function, at sites that would continue to be protected by investment in dune maintenance. Overall wildlife would be adversely impacted. Over time much of the developed area on the island would become much more intensely developed with more impervious surfaces (rooftops and paved roads) and pervious paving (parking areas) when compared to the current condition. Previous development sites, where land area continues to exist, would be rehabilitated to foster a return to natural conditions and disturbed areas adjoining finished structures would be revegetated with native grasses,

shrubs, and trees; these actions would minimally offset habitat losses associated with development of new facilities by creating habitat of value to some species.

Altered sand transport processes at Ocean City Inlet would continue to be mitigated in collaboration with the USACE. This would benefit species inhabiting beach and intertidal habitats by alleviating sand starvation of the island (from the stabilized inlet) and indirectly helping to create overwash fans and replenish back-barrier marshes. Overwash areas are a dynamic habitat that supports shorebirds and rare island fauna, including suitable habitat conditions for the threatened piping plover (*Charadrius melodus*).

**Natural Resource Management Actions.** Existing and new planned monitoring programs and research would generally benefit seashore wildlife. Water quality monitoring programs and research would benefit aquatic invertebrates, finfish, marine mammals, and diverse migratory birds that inhabit the seashore's bay subtidal and mudflat habitats by enhancing understanding of water quality conditions, trends, and pollutant sources, helping to focus future research and monitoring to address water quality threats within the watershed, and providing the basis for defining and implementing measures to adapt to change and reduce the adverse effects of sea level rise. Wildlife inhabiting bay subtidal areas would also benefit from continued annual monitoring of seagrass and submerged aquatic vegetation (SAV); these actions would assist with understanding the processes to maintain the seashore's seagrass beds. Continued saltmarsh monitoring would provide information on relative saltmarsh elevation needed to interpret changes in saltmarsh vegetation and would contribute to worldwide efforts to monitor sea level rise with by measuring the amount of erosion and accretion on saltmarsh surfaces; together with continued monitoring of marsh birds and saltmarsh nekton, this would benefit saltmarshes and the wildlife that inhabit them by providing metrics for future condition assessments and could enhance early identification of degradation from climate change. A new baseline groundwater monitoring program would benefit inland wetlands – the only source of freshwater to support wildlife populations, including the seashore's horses – by enhancing understanding of the interrelationships of groundwater and storm overwash/flooding events. Continued monitoring, tracking, and eradicating invasive plant species would benefit most species inhabiting the seashore's bay subtidal areas and mudflats, saltmarshes, forests and shrubland, inland wetlands, and dunes and grasslands by eliminating species that outcompete native flora and that lower plant diversity in native coastal communities.

NPS would continue scientific and scholarly research focused on developing a better understanding of natural coastal processes and the effects of climate change/sea level rise. Existing partnerships and cooperative relationships with Maryland and Virginia resource management agencies, Worcester County, Accomack County, the Maryland Coastal Bays Program, and various academic institutions and conservation organizations

would continue to support ongoing water resource monitoring, research, and watershed conservation planning. These partnerships would continue to benefit wildlife inhabiting the seashore's saltmarsh and bay subtidal and mudflat habitats by providing information needed to better understand water quality conditions, trends, and pollutant sources, and by facilitating coordinated efforts toward addressing water quality threats within the watershed that threaten these habitats.

Management actions would continue to restore island habitats altered by historic land use, including removal of six hunting lodges, two private residences, access roads, and water impoundments in the seashore's backcountry. Structures and other impervious surfaces would be removed and sites rehabilitated to foster a return to natural conditions, resulting in a beneficial impact on wildlife that inhabit the seashore's forests, shrublands, dunes, grasslands, and saltmarshes.

Filling mosquito ditches in the Maryland portion of the seashore would continue. Currently, the seashore has filled about 10 percent of its 48,000 meters of mosquito ditches. Continued ditch restoration would have a beneficial impact on saltmarsh vegetation by helping to restore natural surface and groundwater flows from the island to the bayside and tidal flows in and out of saltmarshes. This would benefit wildlife inhabiting saltmarshes, bay subtidal areas, and mudflats by enhancing the health and function of saltmarsh vegetation and reducing nutrient export from marshes to bay waters

*Phragmites australis* removal from saltmarsh, forest and shrubland, inland wetlands, and dunes and grassland would continue using a combination of standard, ground-based control methods in combination with aerial spraying and prescribed fire or mowing as needed in heavily infested areas. These actions would have a beneficial impact on wildlife relying on these habitats by helping to restore natural sediment levels and hydrologic flows and by eliminating species that outcompete native flora and that lower plant diversity in native coastal communities. Systemic herbicides would be used that do not bioaccumulate in the aquatic food chain, that exhibit very low toxicity to bacteria, fungi, and animals, and that are rapidly removed from the environment by chemical bonding with soil particles and microbial degradation.

Horse management would continue with the goal of reducing the feral horse population to a sustainable population of 80 to 100 individuals. This would benefit wildlife that inhabit saltmarshes, forests, and shrublands, inland wetlands, dunes, and grasslands by reducing overgrazing, trampled vegetation, and addition of nutrients that adversely impact wildlife habitat.

Hunting management would continue to benefit the seashore's wildlife by reducing the size of the non-native sika deer and white-tailed deer population to levels, which would contain impacts on plant species native to the seashore's forest and shrubland habitat.

A new hunting monitoring program would enhance management of both sika deer and native white-tailed deer by providing information needed to develop deer density and deer herbivory indices that would inform management decisions aimed at protecting native plant species. If access to the OSV area is lost, access for public hunting could be significantly reduced or lost and deer populations could increase with potential adverse impacts on wildlife due to adverse impacts on their habitat. NPS would explore alternative public hunting strategies to manage deer populations.

NPS would continue to not enforce existing federal laws prohibiting horseshoe crab harvest. Horseshoe crab harvest would continue to directly contribute to a decline of spawning horseshoe crabs in the Toms Cove area (US FWS 2015). A decline in horseshoe crabs could negatively impact shorebirds for which horseshoe crab eggs are an important food source during critical migration periods (US FWS 2015).

**Cultural Resource Management Actions.** NPS efforts to identify, manage, and protect cultural resources would continue. When historic structures could no longer be protected from natural coastal processes and the impacts of climate change/sea level rise, they would be demolished and the sites restored to foster a return to natural conditions, resulting in a beneficial impact on wildlife that inhabit the seashore's forests, shrublands, dunes, and grasslands.

At the Assateague Beach U.S. Coast Guard Station, boat dock repairs would have minor short-term adverse impacts on wildlife inhabiting dunes and grasslands in the dock area. Restoration of electrical service would require trenching for conduit installation from the Tom's Cove recreational beach to the station, also resulting in minor short-term adverse impacts on wildlife inhabiting dunes and grasslands.

**Visitor Use and Visitor Experience Management Actions.** Confinement of oversand vehicle use within the existing designated OSV use area would continue to limit the area within which adverse impacts occur to wildlife inhabiting the beach and adjoining dunes and grasslands where vehicle use occurs. Impacts would include loss of wildlife killed by OSV passes, disturbances due to noise and human activity, and changed habitat conditions such as sand compaction, sand displacement, reduced growth of protective foredunes, loss of food sources damaged or killed by human activity, and erosion typically associated with OSV use. If vehicular access is lost, and the breach management plan recommends that the breach remain open, there would be a beneficial impact to wildlife because vehicles would be eliminated from part or all of the OSV use area.

**Seashore Operations Management Actions.** Based on analysis of historic visitation counts, seashore visitation in Maryland is expected to increase by approximately 8,000 visitors per year as long as there is vehicular access to the seashore. The majority of this growth will be in day-use visitors, as campgrounds are already at capacity most days during the peak summer season. Additional visitors would increase the potential for

impacts on wildlife inhabiting the seashore's dunes, grasslands, beaches, and intertidal areas in day-use areas where visitor use is concentrated. Impacts would continue to include loss of wildlife killed because of human interactions or vehicles, disturbances due to noise and human activity, and changed habitat conditions such as trampling, soil compaction, loss of food sources damaged or killed by human activity, and vegetation loss. NPS would continue to restrict visitor access to habitat areas through the use of designated trails and boardwalks. Some increase in impervious surfaces is likely, with the potential to cause minimal loss of habitat that could also affect the seashore's habitats. These potential impacts would be mitigated by implementing best management practices for wildlife protection.

Development of 20 bedrooms of seasonal housing in Maryland and 17 bedrooms of seasonal housing in Virginia would disturb approximately one to two acres of vegetation near existing buildings during construction, and convert approximately one acre to impervious surfaces associated with new buildings, parking, access drives, and walkways. Short-term adverse impacts to wildlife would occur in the construction site vicinity due to noise and human activity; long-term impacts would include minor loss of habitat where shrubland and landscaped areas adjoining existing seashore facilities are converted to developed uses.

Withdrawals from wells to meet the daily visitor and NPS employee demands for water would not affect the availability of freshwater for wildlife in the seashore's inland wetlands. Water would continue to be drawn from deep groundwater aquifers that do not supply freshwater to the seashore's inland wetlands.

Miscellaneous repairs would be made to the seashore's headquarters complex, visitor use facilities, seashore operations facilities, roads, and trails. Minor soil disturbances would generally affect landscaped areas and mowed grass adjoining existing structures. Short-term adverse impacts to wildlife would occur in the construction site vicinity due to noise and human activity. Following construction disturbed areas would be revegetated with native grasses, shrubs, and trees, replacing disturbed habitat that would support species typical of the pre-construction condition.

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have the potential to impact wildlife include sand transport projects, sediment dredging projects, and actions by the US FWS implementing the comprehensive conservation plan for Chincoteague National Wildlife Refuge. Some wildlife habitats are also affected by actions within the coastal bays watershed that have the potential to impact water quality (see section 4.2.2) and by land uses within and outside the region that adversely impact air quality, contributing to high levels of ozone and atmospheric deposition of nitrogen at the seashore.

The overall cumulative impacts on wildlife would be primarily beneficial because of improvements to the overall condition of seashore habitats because of collaborative efforts by public agencies, local governments, and non-profit partners to reduce water pollutant loads from point and non-point sources throughout the coastal bay watersheds, and because of national programs to enhance air quality which help to reduce ozone and atmospheric deposition of nitrogen. Alternative 1 would add a noticeable increment to the overall beneficial cumulative impact through continuation of natural resource management actions that restore island habitats altered by historic land use and mosquito ditching, remove invasive *Phragmites australis*, manage horses to reduce impacts to habitats, and continue to reduce deer populations through managed hunting. There would also be adverse cumulative impacts on wildlife associated with pollutant discharges from previously permitted and new construction activities and land uses within the watershed, particularly where they occur outside sewer service areas, as well as with continued air quality impacts. Alternative 1 would add an imperceptible adverse increment to the overall adverse cumulative impact due to minor habitat disturbance and clearing for new seashore facilities, and due to annual growth in visitation (as long as there is vehicular access to the island) with the potential to impact adversely habitat and to increase loss of wildlife because of human interactions.

- **Conclusions**

In alternative 1 management actions would have both adverse and beneficial impacts on wildlife and would add an imperceptible adverse increment and a noticeable beneficial increment to the total cumulative adverse and beneficial impacts on wildlife, respectively.

Adverse impacts on wildlife would result from construction of visitor use facilities, including short-term habitat disturbances during construction and long-term loss of habitat where new facilities are located. Major construction projects affecting wildlife and their habitat would include: concentration of new visitor use facilities within the developed area to replace those lost or damaged by coastal storms or the effects of climate change/sea level rise, new housing (37 bedrooms) for seasonal staff, miscellaneous repairs to the seashore headquarters complex, repairs to the boat dock at the Assateague Beach U.S. Coast Guard Station, and restoration of electrical service to the coast guard station. Adversely affected wildlife would generally include species inhabiting the island's forest, shrublands, dunes, and grasslands. Other adverse impacts to wildlife would result from: reduced or lost access for public hunting via the OSV route (if access is lost), resulting in potential for increased deer populations and associated overgrazing of wildlife habitats; increased visitor use in day-use areas dispersed throughout the Maryland Island Developed Area where adequate land area remains (as long as there is vehicular access) primarily affecting wildlife inhabiting the beach, intertidal areas, dunes, grasslands, forest, and shrublands; continued use of oversand vehicles within the existing designated OSV use area, affecting wildlife

inhabiting the beach, intertidal areas, dunes, and grasslands; continued dune maintenance to protect visitor facilities and seashore infrastructure in the Maryland Island Developed Area that adversely impacts wildlife inhabiting saltmarshes, dunes, grasslands, beaches, and intertidal areas by preventing natural overwash processes and inhibiting sand replenishment; and continued horseshoe crab harvesting. These impacts would not be significant because of the simultaneous implementation of best management practices and continued actions consistent with NPS management policies protecting wildlife and wildlife habitats, within the context of wildlife and wildlife habitat throughout the seashore.

Beneficial impacts would result over the long-term from continuation of existing natural resource management actions that would generally enhance wildlife habitats throughout the seashore, including: restoring natural surface and groundwater flows in saltmarsh habitat by filling remaining mosquito ditches; enhancing hydrologic flows and reducing sedimentation in saltmarsh habitat, forest and shrubland habitat, inland wetland habitat, and dunes and grassland habitat by reducing the aerial coverage of *Phragmites australis* from 5.6 percent to 2 percent; fostering a return to natural conditions in areas where historic land uses and construction of new facilities have damaged or resulted in loss of natural habitats by revegetating with native grasses, shrubs, and trees; monitoring, tracking, and eradicating invasive plants from all seashore habitats; and enhancing understanding of conditions, issues, and trends in the seashore's wildlife populations and their habitats through monitoring, planned special studies, and cooperative relationships with state and local agencies, academic institutions, and conservation organizations. Long-term benefits would also result from: reducing overgrazing, vegetation trampling, addition of nutrients, and loss of sensitive plant species by reducing the feral horse population to a sustainable population of 80 to 100 individuals; protecting wildlife habitats from overgrazing by sika deer and native white-tailed deer by continuing to allow hunting and implementing a hunting monitoring program to support more effective deer management; alleviating sand starvation of beach and intertidal habitat caused by the stabilized Ocean City Inlet and replenishing sand in back-barrier marshes and overwash fan areas in the north end by restoring natural overwash processes. Collectively, the beneficial impacts would not be significant because, while the management actions would benefit wildlife in habitats that are fundamental to the seashore and would address significant threats to fundamental resources, the impacts would be short-term (continuing until access is lost and/or resources are no longer available to sustain natural resource management programs) and probably not readily apparent. Once vehicular access is lost, rehabilitation and restoration of island habitats would slow and possibly be curtailed, with the result that the intensity of the beneficial impacts on wildlife would be greatly diminished.

### 4.4.3 IMPACTS COMMON TO ALL ACTION ALTERNATIVES

- **Impact Analysis**

**Coastal Response Management Actions**. As in alternative 1, under alternatives 2, 3, and 4, facilities lost or damaged by natural coastal processes or the effects of climate change/sea level rise would be replaced or repaired, if funding is available, consistent with the underlying principles of each alternative. While the timing and extent to which facilities would continue to be replaced would vary in alternatives 2, 3, and 4, the nature of the impacts on seashore wildlife associated with replacement would be similar to those described for alternative 1 (section 4.4.2).

**Natural Resource Management Actions.** In alternatives 2, 3, and 4, actions to protect the seashore's unique working marine landscape and way of life would have a beneficial impact on the seashore's marine wildlife. New research undertaken in collaboration with the states of Maryland and Virginia would enhance understanding of the conditions of the seashore's marine environment, better informing future decisions regarding management of marine wildlife.

Enforcement of existing federal laws prohibiting harvest of horseshoe crabs (as proposed by FWS in the Final CCP/EIS) would effectively eliminate illegal horseshoe crab harvesting in the Toms Cove area (US FWS 2015). This would result in a beneficial~~ly~~ impact on the horseshoe crab population by directly reducing the decline of spawning horseshoe crabs in the Toms Cove area. Reduced decline of spawning crabs could benefit shorebirds for which horseshoe crab eggs are an important food source during critical migration periods (US FWS 2015).

**Visitor Use and Visitor Experience Management Actions.** Until facilities are lost, NPS would generally increase visitor services within the Maryland Island Developed Area. A few new small structures (with parking) would be added to support commercial services within existing previously disturbed visitor use areas. Construction would disturb approximately one to two acres and convert less than one acre to impervious surfaces associated with new buildings, parking, access drives, and walkways. Affected wildlife would include those inhabiting a mix of shrubland and landscaped areas adjoining existing seashore facilities. Following construction disturbed areas adjoining finished structures would be revegetated with native grasses, shrubs, and trees, generally restoring habitat for species found at the sites of new structures prior to disturbance; increased vehicular traffic and human activity at commercial service sites would adversely impact wildlife in the vicinity.

The former visitor center would be rehabilitated as a stand-alone environmental education center. Minor short-term disturbances to landscaped areas adjoining the existing building would occur. No additional impervious surface would be added. Following construction disturbed areas adjoining the finished structure would be

revegetated with native grasses, shrubs, and trees, generally restoring habitat for species found at the visitor center site prior to disturbance.

**Seashore Operations Management Actions.** In collaboration with MD DNR, NPS would develop a new seashore entrance station on the mainland, requiring realignment and widening of MD 611, construction of entrance booths, and addition of employee parking spaces. During construction, road widening and addition of facilities would displace wildlife inhabiting several acres of old field vegetation, weedy vegetation, and mowed grass along MD 611; noise and human activity would disturb wildlife in areas adjoining the construction site. Approximately one to two acres of habitat would be lost to impervious surfaces. Following construction disturbed areas adjoining finished structures would be revegetated with native grasses, shrubs, and trees, providing habitat for less diverse wildlife than found at the site prior to disturbance; slightly increased vehicular traffic and human activity at the site would adversely impact wildlife in the vicinity.

Development of a mainland-based alternative transportation system (ATS) would require development of a shuttle staging area and associated unpaved parking area (for approximately 360 cars) on the mainland and shelters and paved pull-offs at three shuttle stops on the island. During construction, road widening and addition of facilities would displace wildlife inhabiting up to ten acres of old field vegetation, weedy vegetation, and mowed grass in the MD 611 corridor and less than one acre of shrubland or grassland adjoining seashore roads on the island; noise and human activity would disturb wildlife in areas adjoining the construction sites. Approximately ten acres of habitat would be lost on the mainland and less than 0.25 acre of habitat would be lost on the island; increased vehicular traffic and human activity at the staging area and shuttle stops would adversely impact wildlife near each site. Following construction disturbed areas adjoining finished structures would be revegetated with native grasses, shrubs, and trees, providing habitat for less diverse wildlife than found at the parking area and shuttle sites prior to disturbance.

Non-structural stabilization of the mainland shoreline near the visitor center would benefit vegetation in nearby bay subtidal and mudflat habitat by reducing shoreline erosion and sedimentation of bay waters.

### 4.4.4 ALTERNATIVE 2 – CONCENTRATED TRADTIONAL BEACH RECREATION

- **Impact Analysis**

**Coastal Response Management Actions.** Artificial dune fortification and beach nourishment would protect the Maryland Island Developed Area from the effects of natural coastal processes and climate change/sea level rise as long as suitable land base exists and funding is available. The seashore would expand partnerships with the USACE to provide additional sand to provide additional sand to mitigate the erosional forces

associated with storms and/or sea level rise. This effort, as well as planting of dunes and fencing to trap sand and exclude grazing horses from the dune, could substantially slow the loss of the developed area to natural coastal processes; however, it would also have an adverse impact on wildlife inhabiting saltmarshes, dunes and grasslands, beaches, and intertidal areas by interfering with sand transport from the beach to island interiors and depriving back-barrier marshes and overwash fans of sand replenishment needed to sustain habitats.

As land and facilities are lost, they would be rebuilt using more sustainable design within the remaining protected developed area, concentrating visitor use and facilities within a smaller area. To the maximum extent, facilities would be temporary, designed to be removed in advance of coastal storms. Facilities to be replaced would be moved back from the shoreline and made more sustainable in form and function, at sites that would continue to be protected by investment in dune maintenance. Overall wildlife would be adversely impacted. Over time most areas the developed area on the island would become much more intensely developed with more impervious surfaces (rooftops and paved roads) and pervious paving (parking areas) when compared to the current condition. Previous development sites, where land area continues to exist, would be rehabilitated to foster a return to natural conditions and disturbed areas adjoining finished structures would be revegetated with native grasses, shrubs, and trees; these actions would minimally offset habitat losses associated with development of new facilities by creating habitat of value to some species.

**Natural Resource Management Actions.** Studies would be completed as in alternative 1. However, the ability of NPS to encourage and support cooperative research would likely decline over time as support for natural resource management would likely be re-directed toward activities protecting recreation opportunities. This would adversely impact efforts to address the challenges of climate change/sea level rise and diminishing detection of emerging threats to the seashore's wildlife populations. Water quality monitoring, saltmarsh monitoring, groundwater monitoring, and invasive species monitoring would be reduced, resulting in an adverse impact on the seashore's wildlife due to less understanding of issues and trends needed to shape effective resource management and to focus collaboration with other public agencies, academic institutions, and non-governmental organizations to address threats.

Natural resource management programs and activities would continue as in alternative 1 although over time their scope would diminish. Filling mosquito ditches in the Maryland portion of the seashore would likely diminish, reducing benefits to the health and function of saltmarsh habitat and with less benefit to wildlife inhabiting bay subtidal and mudflat habitats accruing from bay water quality enhancements due to reducing nutrient export from marshes.

Reduced scope of other natural resource management actions – such as *Phragmites australis* removal, other vegetation restoration and protection, and beach and bayside wetlands protection – would reduce current benefits from those actions to wildlife inhabiting all seashore habitats.

Reduced access to the north end by implementing a permit system requiring a docking/mooring pass would benefit wildlife inhabiting dunes, grasslands, beach and intertidal areas by reducing visitor use impacts to areas where NPS management actions are underway to restore natural overwash processes to benefit these habitats.

As in alternative 1, hunting management would continue to benefit the seashore's wildlife by reducing the size of the non-native sika deer and white-tailed deer population to levels which would contain impacts on plant species native to the seashore's forest and shrubland habitat, and a new hunting monitoring program would better inform management decisions aimed at protecting native plant species. In alternative 2, the benefits of public hunting to vegetation would be reduced because the OSV area would be smaller, making access to the backcountry more difficult for hunters with that result fewer deer would be taken annually. If access to the OSV area is lost, no action would be taken to restore it; access for public hunting could be significantly reduced or lost and deer populations could increase with potential adverse impacts on on wildlife due to adverse impacts on their habitat. NPS would explore alternative public hunting strategies to manage deer populations.

Working with Virginia to ensure appropriate wastewater treatment and disposal at privately owned structures (oyster watch houses and hunting blinds) located within the seashore's Virginia waters would reduce discharge of nutrients, pathogens, and other contaminants into bay waters, resulting in a beneficial impact to wildlife inhabiting bay subtidal and mudflat habitats.

**Cultural Resource Management Actions.** NPS efforts to identify, manage, and protect cultural resources would continue. When historic structures could no longer be protected from natural coastal processes and the impacts of climate change/sea level rise, they would be demolished and the sites restored to foster a return to natural conditions, resulting in a beneficial impact on wildlife that inhabit the seashore's forests, shrublands, dunes, and grasslands.

**Visitor Use and Visitor Experience Management Actions.** Oversand vehicle use would be confined within a smaller designated OSV use area (extending south of the Maryland Island Developed Area to approximately KM 23.4). Confinement within this smaller area would further limit the area within which adverse impacts occur to wildlife inhabiting the beach and adjoining dunes and grasslands where vehicle use occurs. Impacts would include loss of wildlife killed by OSV passes, disturbances due to noise and human activity, and changed habitat conditions such as sand compaction, sand displacement,

reduced growth of protective foredunes, loss of food sources damaged or killed by human activity, and erosion typically associated with OSV use. If vehicular access is lost, and the breach management plan recommends that the breach remain open, there would be a beneficial impact to wildlife because vehicles would be eliminated from part or all of the OSV use area.

**Seashore Operations Management Actions.** Seashore operations would be based in a rehabilitated headquarters complex in the Maryland Mainland Developed Area. Minor soil disturbances would generally affect landscaped areas and mowed grass adjoining existing structures. Short-term adverse impacts to wildlife would occur in the construction site vicinity due to noise and human activity. Following construction disturbed areas would be revegetated with native grasses, shrubs, and trees, replacing disturbed habitat that would support species typical of the pre-construction condition.

Approximately 10 acres would be acquired near the existing seashore headquarters complex to develop a shuttle staging area and associated visitor unpaved parking area (for approximately 360 cars). Construction of this facility is common to alternatives 2, 3, and 4, although where the action would occur would vary slightly. Impacts on wildlife are summarized above in section 4.4.3.

Electricity and potable water would be extended to approximately 90 existing campsites. During construction trenching for underground installation of lines, noise and human activity would disturb wildlife. The impact area would generally be in previously disturbed areas along the edges of existing seashore roads, where noise and human activity levels are already high. Following construction disturbed areas would be revegetated with native grasses resulting in no loss of habitat.

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have impacts on wildlife would be the same as those identified for alternative 1.

The overall cumulative impacts on wildlife would be primarily beneficial because of improvements to the overall condition of seashore habitats because of collaborative efforts by public agencies, local governments, and non-profit partners to reduce water pollutant loads from point and non-point sources throughout the coastal bay watersheds, and because of national programs to enhance air quality which help to reduce ozone and atmospheric deposition of nitrogen. Alternative 2 would add a noticeable increment to the overall beneficial cumulative impact through continuation of natural resource management actions that restore island habitats altered by historic land use and mosquito ditching, remove invasive *Phragmites australis*, manage horses to reduce impacts to habitats, and continue to reduce deer populations through managed hunting. There would also be adverse cumulative impacts on wildlife associated with pollutant discharges from previously permitted and new construction

activities and land uses within the watershed, particularly where they occur outside sewer service areas, as well as with continued air quality impacts. Alternative 2 would add a noticeable adverse increment to the overall adverse cumulative impact due to habitat disturbance and clearing for new seashore facilities, and due to annual growth in visitation (as long as there is vehicular access to the island) with the potential to impact adversely habitat and to increase loss of wildlife because of human interactions.

- **Conclusions**

In alternative 2 management actions would have both adverse and beneficial impacts on wildlife and would add a noticeable adverse increment and a noticeable beneficial increment to the total cumulative adverse and beneficial impacts on wildlife, respectively.

Adverse impacts on wildlife would result from construction of visitor use facilities, including short-term habitat disturbances during construction and long-term loss of habitat where new facilities are located. Major construction projects would include: concentration of new visitor use facilities within a smaller developed area to replace those lost or damaged by coastal storms or the effects of climate change/sea level rise, new housing for seasonal staff, a new seashore entrance station on the mainland, facilities to support a mainland-based alternative transportation system, a few small structures to support increased visitor services in the island developed area, rehabilitation of the seashore headquarters complex, and extension of electricity and potable water to approximately 90 existing campsites. Adversely affected wildlife would generally include species inhabiting the island's forest, shrublands, dunes, and grassland on the island and old field, mowed grass, and landscaped areas around existing seashore buildings on the mainland. Other adverse impacts to wildlife would result from: reduced or lost access for public hunting via the OSV route, resulting in potential increased deer populations and associated overgrazing of wildlife habitats; increased visitor use in day-use areas within a shrinking protected Maryland Island Developed Area (as long as there is vehicular access), affecting wildlife inhabiting the beach, intertidal areas, dunes, grasslands, forest, and shrublands; continued use of oversand vehicles within a smaller designated OSV use area, reducing adverse impacts to wildlife inhabiting the beach, intertidal areas, dunes, and grasslands within the OSV use area; and enhanced dune maintenance to protect visitor facilities and seashore infrastructure in the Maryland Island Developed Area that would adversely impact wildlife by further preventing natural overwash processes and inhibiting sand replenishment in the developed area's saltmarshes, dunes, grasslands, beach, and intertidal habitat. Over time the scope of natural resource management programs and activities would diminish. Some of these impacts would not be significant because of the simultaneous implementation of best management practices and continued actions consistent with NPS management policies protecting wildlife and wildlife habitats, within the context of the overall quality of wildlife and wildlife habitats throughout the seashore. However, the adverse impacts on wildlife associated with intensification of development within

the Maryland Island Development Area and its fortification to withstand the impacts of coastal storms and the effects of climate change/sea level rise would be significant; extensive areas of dunes, grasslands, forest, and shrubland upon which the seashore's wildlife depend that are fundamental to the seashore would be lost, and extensive areas of beach, intertidal flats, dunes, grasslands, and saltmarsh that are also fundamental to the seashore would be seriously threatened by sand starvation caused by enhanced fortification that would curtail natural overwash processes.

Beneficial impacts would result over the long-term from continuation of existing natural resource management actions that would generally enhance wildlife habitats throughout the seashore, including: restoring natural surface and groundwater flows in saltmarsh habitat by filling remaining mosquito ditches; enhancing hydrologic flows and reducing sedimentation in saltmarsh habitat, forest and shrubland habitat, inland wetland habitat, and dunes and grassland habitat by reducing the aerial coverage of *Phragmites australis*; fostering a return to natural conditions in areas where historic land uses and construction of new facilities have damaged or resulted in loss of natural habitats by revegetating with native grasses, shrubs, and trees; monitoring, tracking, and eradicating invasive plants from all seashore habitats; enhancing understanding of conditions, issues, and trends in the seashore's wildlife populations and their habitats through monitoring, planned special studies, and cooperative relationships with state and local agencies, academic institutions, and conservation organizations. Long-term benefits would also result from reducing overgrazing, vegetation trampling, addition of nutrients, and loss of sensitive plant species by reducing the feral horse population to a sustainable population of 80 to 100 individuals; protecting wildlife habitats from overgrazing by sika deer and native white-tailed deer by continuing to allow hunting and implementing a hunting monitoring program to support more effective deer management; limiting use of the north end beach; alleviating sand starvation of beach and intertidal habitat caused by the stabilized Ocean City Inlet; replenishing sand in back-barrier marshes and overwash fan areas in the north end by restoring natural overwash processes; and enforcing federal laws prohibiting horseshoe crab harvest. Collectively, the beneficial impacts would not be significant because, while the management actions would benefit wildlife and wildlife habitats that are fundamental to the seashore and would address significant threats to fundamental resources, the impacts would be short-term (continuing until access is lost and/or resources are no longer available to sustain natural resource management programs) and probably not readily apparent, depending upon when existing natural resource management programs are diminished or curtailed. Once vehicular access is lost, rehabilitation and restoration of island habitats would slow and possibly be curtailed, with the result that the intensity of the beneficial impacts on wildlife would be greatly diminished.

### 4.4.5 ALTERNATIVE 3 – SUSTAINABLE RECREATION AND CLIMATE CHANGE ADAPTATION (NPS PREFERRED ALTERNATIVE)

- **Impact Analysis**

**Coastal Response Management Actions.** Seashore management would allow the island to evolve naturally, relocating and designing new facilities to be more sustainable. The seashore would no longer work with the USACE to provide additional sand to provide additional sand to mitigate the erosional forces associated with storms and/or sea level rise. No new investments would be made in dune fortification through planting and fencing installation. Over time natural overwash would resume throughout the developed area. This would benefit wildlife inhabiting the beach, intertidal area, dunes, grasslands, and saltmarshes in the developed area by restoring sand transport from the beach to the island interiors, creating overwash fans and replenishing sand in back-barrier marshes.

Visitor use infrastructure would evolve to more sustainable designs and likely shift to new, more stable locations initially on the island; over time development on the island would become less intensive, with fewer facilities and less impervious surfaces as visitor use facilities are slowly moved to the mainland. To the maximum extent, facilities would be temporary, designed to be removed in advance of coastal storms. Facilities lost or damaged by natural coastal processes or the effects of climate change/sea level rise would be replaced or repaired, if funding is available, at sites further from the shoreline at sites that do not require continued investment in dune maintenance where they can be made more sustainable in form and function. The location, extent, and type of habitat lost and wildlife species affected would depend on when and where seashore facilities and infrastructure would be lost and replaced. Over time wildlife habitat would be generally enhanced. The developed area on the island would become more primitive with less extensive developed facilities with fewer impervious surfaces (rooftops and paved roads) and less pervious paving (parking areas) when compared to the current condition. Previous development sites would be rehabilitated to foster a return to natural conditions and disturbed areas adjoining new finished structures would be revegetated with native grasses, shrubs, and trees; these actions would generally offset habitat losses associated with development of new replacement facilities.

If bridge access is lost, access would transition to all water access. Beneficial impacts to wildlife inhabiting dunes, grasslands, and forests in the developed area would result from removal of most vehicles from the island (with the exception of NPS operations vehicles and beach shuttles) and from removal of 150 campsites, other visitor facilities, paved roads, and the NPS maintenance yard. This would benefit wildlife by reducing impacts from vehicles (noise and drive-by deaths), reducing human activity and associated disturbances to wildlife, and enhancing habitats by fostering a return to natural conditions in areas where developed uses are removed.

**Natural Resource Management Actions.** Studies would be completed as in alternative 1. Existing and new planned monitoring programs and research would benefit wildlife in all seashore habitats. Cooperative research would expand, accelerating growth in the understanding of seashore resources and ecological processes. Data from an expanded monitoring network, as well as new ecological research, would provide a significant increase in information needed to understand better conditions, trends, and threats in the seashore's wildlife populations and their habitats.

Natural resource management programs and activities would continue as in alternative 1 although over time programs would expand to address issues created by global climate change. In alternative 3, actions would generally seek to enhance resiliency of saltmarshes and inland wetlands resulting in a beneficial impact on wildlife.

Reduced access to the north end by implementing a permit system requiring a docking/mooring pass would benefit wildlife inhabiting dunes, grasslands, beach and intertidal areas by reducing visitor use impacts to areas where NPS management actions are underway to restore natural overwash processes to benefit these habitats.

As in alternative 1, hunting management would continue to benefit the seashore's wildlife by reducing the size of the non-native sika deer and white-tailed deer population to levels which would contain impacts on plant species native to the seashore's forest and shrubland habitat, and a new hunting monitoring program would better inform management decisions aimed at protecting native plant species. In alternative 3, if access to the OSV area is lost, consideration would be given to modifying the OSV route or relocating it to another more suitable location, thereby maintaining public access for hunting and its beneficial impacts to vegetation by reducing deer populations. Over time, however, it is possible that access for public hunting could be significantly reduced or lost and deer populations could increase with potential adverse impacts on wildlife due to adverse impacts on their habitat.

Working with Virginia, NPS would assess the legal status of privately owned structures (oyster watch houses and hunting blinds) located within the seashore's Virginia waters and pursue removal of those found to be unauthorized. For authorized structures, NPS would work with Virginia to ensure appropriate wastewater treatment. Collectively, these actions would reduce discharge of nutrients, pathogens, and other contaminants into bay waters resulting in a beneficial impact on aquatic wildlife inhabiting bay subtidal areas and mudflats.

Working with Worcester County, Accomack County, and conservation organizations, NPS would support efforts to protect land (through fee simple purchase or conveyance of conservation easements) within the watersheds of Chincoteague Bay and Newport Bay for conservation and climate change adaptation purposes. Conservation of these

lands would benefit wildlife inhabiting a variety of mainland habitats by protecting habitats from future loss to developed land uses.

NPS would collaborate with its conservation partners to acquire approximately 150 to 200 acres of buffer lands adjoining the one to three new points of departure on the Chincoteague Bay mainland in Worcester County. Land conservation would permanently protect these lands from loss to developed land uses; long-term management would facilitate return to natural conditions, as appropriate, with beneficial impacts to wildlife inhabiting a variety of mainland habitats, particularly saltmarsh along the bayshore.

**Cultural Resource Management Actions.** Implementation of non-structural storm protection measures (such as dune nourishment and planting) to protect the Assateague Beach U.S. Coast Guard Station would continue to prevent natural processes of sand overwash in the station vicinity. This would continue to impact adversely vegetation in dunes and grassland habitat and beach and intertidal habitat by interfering with sand transport from the beach to island interiors and depriving back-barrier marshes and overwash fans of sand replenishment needed to sustain habitats.

**Visitor Use and Visitor Experience Management Actions.** Once camping facilities are no longer sustainable in the Maryland Island Developed Area or when vehicular access to the island is lost, NPS would collaborate with MD DNR to develop a new campground on the mainland. Facilities would be replaced on an approximate 175-acre site in the MD 611 corridor near the existing seashore headquarters complex. Campground development would entail minimal clearing and grading of the site, paved road construction, utility installations, development of 150 campsites (including approximately 40 sites with paved pads/pull-throughs), and construction of comfort facilities and shower buildings, an amphitheater, sewage dump station, and an entrance station with parking). During construction, wildlife inhabiting the site would be displaced; noise and human activity would disturb wildlife in areas adjoining the construction site. Following construction several acres of field and forest habitat would be converted to developed uses resulting in an adverse impact on wildlife; disturbed areas adjoining finished structures would be revegetated with native grasses, shrubs, and trees, providing habitat for less diverse wildlife than found at the site prior to disturbance. Increased vehicular traffic and human activity at the campground would adversely impact wildlife in the vicinity.

As in alternative 1, confinement of oversand vehicle use within the existing designated OSV use area would continue to limit the area within which adverse impacts occur to wildlife inhabiting the beach and adjoining dunes and grasslands where vehicle use occurs. Impacts would include loss of wildlife killed by OSV passes, disturbances due to noise and human activity, and changed habitat conditions such as sand compaction, sand displacement, reduced growth of protective foredunes, loss of food sources damaged or killed by human activity, and erosion typically associated with OSV use. If

vehicular access is lost, and the breach management plan recommends that the breach remain open, there would be a beneficial impact to wildlife because vehicles would be eliminated from part or all of the OSV use area.

Expanded use of Egging Island for environmental education would increase visitor use to the island. New facilities would include an expanded soft landing for canoes and kayaks, clearing for a primitive group campsite, and installation of relocatable vault toilets. Minor areas would be cleared at the campsite and soft landing site, adversely impacting wildlife inhabiting affected bay subtidal areas, mudflats, and/or saltmarsh at the island shore and forest, shrubland, dunes, or grasslands at the campsite, depending upon the site selected. Long-term use of the site by large groups arriving in non-motorized boats would also disturb island habitats on the bayshore; noise and human activity would also adversely impact island wildlife.

Three new bayside access points would be developed to provide water access to existing backcountry campsites and trails, one of which would provide opportunities for access via motorized vessels. Minor areas would be cleared at each access site, adversely impacting wildlife inhabiting bay subtidal areas, mudflats, and/or saltmarsh on the bayshore. Long-term use of the sites by large groups arriving in non-motorized boats would also disturb island habitats on the bayshore; noise and human activity would also adversely impact island wildlife.

On the mainland in Worcester County NPS would seek to acquire from the county two existing points of departure from Chincoteague Bay; the sites would be rehabilitated, as needed, likely including development of a shade shelter and relocatable vault toilet. Rehabilitation could involve disturbance of minor areas at the access points which were previously disturbed when the facility was originally developed. Increased visitor use at the access points, particularly motorized boat access, would disturb island mainland habitats on the bayshore; noise and human activity would also adversely impact island wildlife.

**Seashore Operations Management Actions.** Seashore operations would be relocated to a new headquarters complex in the MD 611 corridor near the seashore entrance. Development would entail clearing and grading of the site and construction of administrative offices, a maintenance complex, paved parking, and paved/unpaved outdoor maintenance storage areas. During construction, wildlife inhabiting up to five acres of old field and/or upland forest would be displaced; noise and human activity would also disturb wildlife in areas adjoining the construction site. Following construction approximately four acres of habitat would be converted to impervious surfaces; disturbed areas adjoining finished structures would be revegetated with native grasses, shrubs, and trees, providing habitat for less diverse wildlife than found at the site prior to disturbance. Increased vehicular traffic and human activity at the new headquarters complex site would adversely impact wildlife in the vicinity.

Approximately 10 acres at the existing seashore headquarters site would be rehabilitated as a shuttle staging area and associated visitor unpaved parking area (for approximately 360 cars). Construction of this facility is common to alternatives 2, 3, and 4, although where the action would occur would vary slightly. Impacts on seashore wildlife are summarized above in section 4.4.3. This facility would remain in use as long as vehicular access to the island is possible; when vehicular access to the island is lost, it would be removed and the site rehabilitated to foster a return to natural conditions restoring habitat for wildlife previously displaced from the site.

When vehicular access to the island is no longer possible, access to the island would shift to a ferry based operation for visitor access and seashore operations at waterfront locations on the mainland and on the island. New mainland facilities near the existing seashore headquarters complex would include a passenger ferry terminal, docking facilities to support seashore operations, administrative offices, maintenance storage facility, paved access roads, unpaved parking area (for up to 700 cars), and unpaved NPS equipment storage yard; new island facilities would include an island terminal facility, docking facilities to support seashore operations, an island shuttle system with shelters and benches. Development would entail clearing and grading of sites on the mainland and the island. On the mainland, construction would adversely impact wildlife inhabiting up to ten acres of old field and/or upland forest habitats. On the island, construction would adversely impact wildlife inhabiting up to two acres, likely composed of a mix of habitat in previously developed land, dunes, grasslands, forest, and shrublands. Along the shore on the mainland and the island, construction of docking facilities would disturb wildlife in saltmarsh, bay subtidal areas, and mudflats. Following construction, disturbed areas adjoining finished structures would be revegetated with native grasses, shrubs, and trees, as appropriate, providing habitat for less diverse wildlife than found at the site prior to disturbance. Increased vehicular traffic and human activity at the docking facility sites would adversely impact wildlife in the vicinity.

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have impacts on wildlife would be the same as those identified for alternative 1.

The overall cumulative impacts on wildlife would be primarily beneficial because of improvements to the overall condition of seashore habitats because of collaborative efforts by public agencies, local governments, and non-profit partners to reduce water pollutant loads from point and non-point sources throughout the coastal bay watersheds, and because of national programs to enhance air quality which help to reduce ozone and atmospheric deposition of nitrogen. Alternative 3 would add an appreciable increment to the overall beneficial cumulative impact through expansion of natural resource management actions that restore island habitats altered by historic land use and mosquito ditching, remove invasive *Phragmites australis*, manage horses

to reduce impacts to habitats, continue to reduce deer populations through managed hunting, and – once access is lost – removal of visitor facilities and reduced visitation. There would also be adverse cumulative impacts on wildlife associated with pollutant discharges from previously permitted and new construction activities and land uses within the watershed, particularly where they occur outside sewer service areas, as well as with continued air quality impacts. Alternative 3 would add a noticeable adverse increment to the overall adverse cumulative impact due to habitat disturbance and clearing for new seashore facilities, and due to annual growth in visitation (as long as there is vehicular access to the island) with the potential to impact adversely habitat and to increase loss of wildlife because of human interactions.

- **Conclusions**

In alternative 3 management actions would have both adverse and beneficial impacts on wildlife and would add a noticeable adverse increment and an appreciable beneficial increment to the total cumulative adverse and beneficial impacts on wildlife, respectively.

Adverse impacts on wildlife would result from construction of visitor use facilities, including short-term habitat disturbances during construction and long-term loss of habitat where new facilities are located. Major construction projects would include: a few new visitor use facilities in sustainable locations on the island to replace those lost or damaged by coastal storms or the effects of climate change/sea level rise, new housing for seasonal staff, a new seashore entrance station on the mainland, facilities to support a mainland-based alternative transportation system, a few small structures to support increased visitor services in the island developed area, construction of a new seashore headquarters complex, repairs to the boat dock at the Assateague Beach U.S. Coast Guard Station, restoration of electrical service to the coast guard station, development of docking facilities on the mainland and the island to support water-based visitor access and seashore operations, and construction of a new campground on the mainland with approximately 150 campsites. Adversely affected wildlife would generally include species inhabiting forest, shrubland, and dunes and grassland on the island and old field, mowed grass, landscaped areas around existing seashore buildings, and upland forest on the mainland. Other adverse impacts to wildlife would result from: increased visitor use in day-use areas dispersed throughout the Maryland Island Developed Area (as long as there is vehicular access) at existing sites where adequate land area remains or at more sustainable sites, primarily affecting wildlife that inhabit the beach, intertidal areas, dunes, grassland, forest, and shrublands; continued use of oversand vehicles within the existing designated OSV use area, affecting wildlife inhabiting the beach, intertidal areas, dunes, and grasslands; and continued dune maintenance at the Assateague Beach U.S. Coast Guard Station that would continue to impact adversely wildlife by preventing natural overwash processes and inhibiting sand replenishment in adjoining saltmarshes , dunes, grasslands, beach and intertidal habitat. These impacts would not be significant because of the simultaneous implementation of

best management practices and continued actions consistent with NPS management policies protecting wildlife and wildlife habitats, within the context of the overall quality of wildlife and wildlife habitats throughout the seashore.

Beneficial impacts would result over the long-term from continuation of existing natural resource management actions that would generally enhance wildlife habitats throughout the seashore, including: restoring natural surface and groundwater flows in saltmarsh habitat by filling remaining mosquito ditches; enhancing hydrologic flows and reducing sedimentation in saltmarsh habitat, forest and shrubland habitat, inland wetland habitat, and dunes and grassland habitat by reducing the aerial coverage of *Phragmites australis* from 5.6 percent to 2 percent; fostering a return to natural conditions in areas where historic land uses and construction of new facilities have damaged or resulted in loss of natural habitats by revegetating with native grasses, shrubs, and trees; monitoring, tracking, and eradicating invasive plants from all seashore habitats; enhancing understanding of conditions, issues, and trends in the seashore's wildlife populations and their habitats through expanded monitoring, additional special studies, and expanded cooperative relationships with state and local agencies, academic institutions, and conservation organizations. Long-term benefits would also result from reducing overgrazing, vegetation trampling, addition of nutrients, and loss of sensitive plant species by reducing the feral horse population to a sustainable population of 80 to 100 individuals; protecting wildlife habitats from overgrazing by sika deer and native white-tailed deer by continuing to allow hunting and implementing a hunting monitoring program to support more effective deer management; reducing visitor use impacts on wildlife in the north end by reducing visitor access by water; alleviating sand starvation of beach and intertidal habitat caused by the stabilized Ocean City Inlet; replenishing sand in back-barrier marshes and overwash fan areas in the north end by restoring natural overwash processes; collaboration with the states to ensure adequate wastewater treatment at oyster watch houses and hunting blinds; supporting conservation partners to establish conservation easements on the mainland within the watersheds of Chincoteague Bay and Newport Bay; collaboration to acquire and protect 150 to 200 acres of natural habitat adjoining one to three new points of departure on the mainland in Worcester County; once vehicular access is lost, removal of visitor use facilities from the island and rehabilitation of sites to foster a return to natural conditions; and enforcing federal laws prohibiting horseshoe crab harvest. Collectively, the beneficial impacts would be significant because they would benefit wildlife and wildlife habitats that are fundamental to the seashore, would address significant threats to fundamental resources, would be long term in duration, and would be readily apparent. Once vehicular access is lost, rehabilitation and restoration of island habitats would continue at a slower rate due to the complexities of water access operations, although impacts on wildlife would continue to be readily apparent and significant.

### 4.4.6 ALTERNATIVE 4 – NATURAL ISLAND EVOLUTION AND A PRIMITIVE ISLAND EXPERIENCE

- **Impact Analysis**

**Coastal Response Management Actions.** Seashore management would allow the island to evolve naturally, maintaining facilities only until they are lost, severely damaged, or become obsolete. As in alternative 3, the seashore would no longer work with the USACE to provide additional sand to provide additional sand to mitigate the erosional forces associated with storms and/or sea level rise. No new investments would be made in dune fortification through planting and fencing installation. Over time natural overwash would resume throughout the developed area. This would benefit wildlife inhabiting the beach, intertidal area, dunes, grasslands, and saltmarshes in the developed area by restoring sand transport from the beach to the island interiors, creating overwash fans and replenishing sand in back-barrier marshes.

Development on the island would become less intensive, with fewer facilities and less impervious surfaces as visitor use facilities are removed, resulting in a beneficial impact on wildlife. Replacement of facilities lost or damaged would be limited to new primitive campsites. The location, extent, and type of habitat lost and wildlife species affected would depend on when and where seashore facilities and infrastructure would be lost and replaced. Over time wildlife habitat would be generally enhanced. The developed area on the island would become much more primitive with very few impervious surfaces and much less pervious paving (parking areas) when compared to the current condition. Previous development sites would be rehabilitated to foster a return to natural conditions and disturbed areas adjoining new finished structures would be revegetated with native grasses, shrubs, and trees; these actions would generally offset habitat losses associated with development of new replacement facilities.

As in alternative 3, if bridge access is lost, access would transition to all water access. Beneficial impacts to wildlife inhabiting dunes, grasslands, and forests in the developed area would result from removal of most vehicles from the island (with the exception of NPS operations vehicles and beach shuttles) and from removal of 150 campsites, other visitor facilities, paved roads, and the NPS maintenance yard. This would benefit wildlife by reducing impacts from vehicles (noise and drive-by deaths), reducing human activity and associated disturbances to wildlife, and enhancing habitats by fostering a return to natural conditions in areas where developed uses are removed.

**Natural Resource Management Actions.** Natural resource management programs and activities would continue as in alternative 1 although over time programs would expand to address mitigation of human impacts and climate change adaptation. In alternative 4, monitoring key climate drivers and resource conditions would increase. Collectively these expanded programs would support actions to enhance resiliency of vulnerable

resources resulting in a beneficial impact on the seashore's wildlife populations and their habitats.

Visitor use impacts on wildlife in the north end would be largely eliminated by prohibiting boat-in visitor use to the area. This would have a beneficial impact because most visiotrs who now access the area by boat would no longer be able or willing to do so. In the future, only visitors willing to hike or paddle the distance to the north end will visit the area. This will significantly reducing the potential for adversse impacts to wildlife and their habitat.

Expanded cooperative research would include more basic science and barrier island ecology research. New ecological research, would provide additional in information needed to better understand wildlife populations, habitat conditions, trends, and pollutant sources, and would help focus collaboration with other public agencies, academic institutions, and non-governmental organizations.

As in alternative 1, hunting management would continue to benefit the seashore's wildlife by reducing the size of the non-native sika deer and white-tailed deer population to levels which would contain impacts on plant species native to the seashore's forest and shrubland habitat, and a new hunting monitoring program would better inform management decisions aimed at protecting native plant species. In alternative 4, if access to the OSV area is lost, no action would be taken to restore it; access for public hunting could be significantly reduced or lost and deer populations could increase with potential adverse impacts on wildlife due to adverse impacts on their habitat. NPS would explore alternative public hunting strategies to manage deer populations.

As in alternative 3, working with Virginia, NPS would assess the legal status of privately owned structures (oyster watch houses and hunting blinds) located within the seashore's Virginia waters and pursue removal of those found to be unauthorized. For authorized structures, NPS would work with Virginia to ensure appropriate wastewater treatment. Collectively, these actions would reduce discharge of nutrients, pathogens, and other contaminants into bay waters resulting in a beneficial impact on aquatic wildlife inhabiting bay subtidal areas and mudflats.

As in alternative 3, working with Worcester County, Accomack County, and conservation organizations, NPS would support efforts to protect land (through fee simple purchase or conveyance of conservation easements) within the watersheds of Chincoteague Bay and Newport Bay for conservation and climate change adaptation purposes. Conservation of these lands would benefit wildlife inhabiting a variety of mainland habitats by protecting habitats from future loss to developed land uses.

**Cultural Resource Management Actions.** As in alternative 3, implementation of non-structural storm protection measures (such as dune nourishment and planting) to protect the Assateague Beach U.S. Coast Guard Station would continue to prevent natural processes of sand overwash in the station vicinity. This would continue to impact adversely vegetation in dunes and grassland habitat and beach and intertidal habitat by interfering with sand transport from the beach to island interiors and depriving back-barrier marshes and overwash fans of sand replenishment needed to sustain habitats.

**Visitor Use and Visitor Experience Management Actions.** New facility development would include development of up to 150 primitive campsites, replacing developed campsites lost to natural coastal processes and the impacts of climate change/sea level rise. Related actions and measures to mitigate impacts on wildlife are summarized above under coastal resource management actions for alternative 4.

As in alternative 1, confinement of oversand vehicle use within the existing designated OSV use area would continue to limit the area within which adverse impacts occur to wildlife inhabiting the beach and adjoining dunes and grasslands where vehicle use occurs. Impacts would include loss of wildlife killed by OSV passes, disturbances due to noise and human activity, and changed habitat conditions such as sand compaction, sand displacement, reduced growth of protective foredunes, loss of food sources damaged or killed by human activity, and erosion typically associated with OSV use. If vehicular access is lost, and the breach management plan recommends that the breach remain open, there would be a beneficial impact to wildlife because vehicles would be eliminated from part or all of the OSV use area.

Visitor use impacts on wildlife inhabiting dunes, grasslands, beaches, and intertidal areas in the north end would be largely eliminated by prohibiting boat-in visitor use.

**Seashore Operations Management Actions.** As in alternative 3, seashore operations would be based in a new headquarters complex to be developed on the mainland in the MD 611 corridor near the seashore entrance on a non-forested upland site. Proposed actions and related impacts on wildlife would be the same as those described for alternative 3 (section 4.4.5).

Approximately 10 acres at the existing seashore headquarters site would be rehabilitated as a shuttle staging area and associated visitor unpaved parking area (for approximately 360 cars). Construction of this facility is common to alternatives 2, 3, and 4, although where the action would occur would vary slightly. Impacts on seashore wildlife are summarized above in section 4.4.3. As in alternative 3, this facility would remain in use as long as vehicular access to the island is possible; when vehicular access to the island is lost, it would be removed and the site rehabilitated to foster a return to natural conditions. Following construction, disturbed areas adjoining finished structures

would be revegetated with native grasses, shrubs, and trees, as appropriate, providing habitat for less diverse wildlife than found at the site prior to disturbance.

As in alternative 3, when vehicular access to the island is no longer possible, access to the island would shift to a ferry based operation for visitor access and seashore operations at waterfront locations on the mainland and on the island. Proposed actions and related impacts on the seashore's wildlife would be the same as those described for alternative 3 (section 4.4.5).

The existing maintenance yard in the Maryland Island Developed Area would be removed and the site rehabilitated to foster a return to natural conditions providing new habitat for wildlife.

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have impacts on wildlife would be the same as those identified for alternative 1.

The overall cumulative impacts on wildlife would be primarily beneficial because of improvements to the overall condition of seashore habitats because of collaborative efforts by public agencies, local governments, and non-profit partners to reduce water pollutant loads from point and non-point sources throughout the coastal bay watersheds, and because of national programs to enhance air quality which help to reduce ozone and atmospheric deposition of nitrogen. Alternative 4 would add an appreciable increment to the overall beneficial cumulative impact through expansion of natural resource management actions that restore island habitats altered by historic land use and mosquito ditching, remove invasive *Phragmites australis*, manage horses to reduce impacts to habitats, continue to reduce deer populations through managed hunting, and – once access is lost – removal of visitor facilities and reduced visitation. There would also be adverse cumulative impacts on wildlife associated with pollutant discharges from previously permitted and new construction activities and land uses within the watershed, particularly where they occur outside sewer service areas, as well as with continued air quality impacts. Alternative 4 would add a noticeable adverse increment due to habitat disturbance and clearing for new seashore facilities, and due to annual growth in visitation (as long as there is vehicular access to the island) with the potential to impact adversely habitat and to increase loss of wildlife because of human interactions.

- **Conclusions**

In alternative 4 management actions would have both adverse and beneficial impacts on wildlife and would add a noticeable adverse increment and an appreciable beneficial increment to the total cumulative adverse and beneficial impacts on wildlife, respectively.

Adverse impacts on wildlife would result from construction of visitor use facilities, including short-term habitat disturbances during construction and long-term loss of habitat where new facilities are located. Major construction projects would include: a few new visitor use facilities in sustainable locations on the island, 150 new primitive campsites on the island (to replace existing developed campgrounds once they are lost or severely damaged), a new seashore entrance station on the mainland, facilities to support a mainland-based alternative transportation system, a few small structures to support increased visitor services in the island developed area (until developed facilities are lost), construction of a new seashore headquarters complex, repairs to the boat dock at the Assateague Beach U.S. Coast Guard Station, restoration of electrical service to the coast guard station, and development of docking facilities on the mainland and the island to support water-based visitor access and seashore operations. Adversely affected wildlife would generally include species inhabiting forest, shrublands, dunes, and grassland on the island and old field, mowed grass, landscaped areas around existing seashore buildings, and upland forest on the mainland. Other adverse impacts to wildlife would result from: increased visitor use in day-use areas dispersed throughout the Maryland Island Developed Area (as long as there is vehicular access) at existing sites where adequate land area remains or at more sustainable sites, primarily affecting wildlife inhabiting the beach, intertidal areas, dunes, grasslands, forest, and shrublands; continued use of oversand vehicles within the existing designated OSV use area, affecting wildlife inhabiting the beach, intertidal areas, dunes, and grassland; and continued dune maintenance at the Assateague Beach U.S. Coast Guard Station that would continue to impact adversely wildlife by preventing natural overwash processes and inhibiting sand replenishment in adjoining saltmarshes , dunes, grasslands, beach and intertidal habitat.. These impacts would not be significant because of the simultaneous implementation of best management practices and continued actions consistent with NPS management policies protecting wildlife and wildlife habitat, within the context of the overall quality of wildlife and wildlife habitats throughout the seashore.

Beneficial impacts would result over the long-term from continuation of existing natural resource management actions that would generally enhance wildlife habitats throughout the seashore, including: restoring natural surface and groundwater flows in saltmarsh habitat by filling remaining mosquito ditches; enhancing hydrologic flows and reducing sedimentation in saltmarsh habitat, forest and shrubland habitat, inland wetland habitat, and dunes and grassland habitat by reducing the aerial coverage of *Phragmites australis* from 5.6 percent to 2 percent; fostering a return to natural conditions in areas where historic land uses and construction of new facilities have damaged or resulted in loss of native vegetation with native grasses, shrubs, and trees; monitoring, tracking, and eradicating invasive plants from all seashore habitats; and enhancing understanding of conditions, issues, and trends in the seashore's wildlife populations and trends through expanded monitoring, additional special studies, and expanded cooperative relationships with state and local agencies, academic institutions,

and conservation organizations. Long-term benefits would also result from reducing overgrazing, vegetation trampling, addition of nutrients, and loss of sensitive plant species by reducing the feral horse population to a sustainable population of 80 to 100 individuals; protecting wildlife habitats from overgrazing by sika deer and native white-tailed deer by continuing to allow hunting and implementing a hunting monitoring program to support more effective deer management; reducing visitor use impacts on wildlife in the north end by reducing visitor access by water; alleviating sand starvation of beach and intertidal habitat caused by the stabilized Ocean City Inlet; replenishing sand in back-barrier marshes and overwash fan areas in the north end by restoring natural overwash processes; collaboration with the states to ensure adequate wastewater treatment at oyster watch houses and hunting blinds; supporting conservation partners to establish conservation easements on the mainland within the watersheds of Chincoteague Bay and Newport Bay; supporting conservation partners to establish conservation easements on the mainland within the watersheds of Chincoteague Bay and Newport Bay; as facilities are lost or severely damaged, removal of visitor use facilities from the island and rehabilitation of sites to foster a return to natural conditions; and enforcing federal laws prohibiting horseshoe crab harvest. Collectively, the beneficial impacts would be significant because they would benefit wildlife and wildlife habitats that are fundamental to the seashore, would address significant threats to fundamental resources, would be long term in duration, and would be readily apparent. Once vehicular access is lost, rehabilitation and restoration of island habitats would continue at a slower rate due to the complexities of water access operations, although impacts on wildlife would continue to be readily apparent and significant.

## 4.5 Federally Listed Threatened or Endangered Species

### 4.5.1 METHODOLOGY FOR ANALYZING IMPACTS

Management actions are qualitatively analyzed with respect to their potential to benefit or adversely impact the nine federally-listed species that inhabit land and waters managed by the NPS within the limits of Assateague National Seashore. Responses to natural coastal processes and the effects of climate change/sea level rise are analyzed to identify potential impacts to these species. Actions are identified and analyzed that have the potential to disturb these species because of new development, changes in seashore operations, or increased visitor use. Actions are also identified that have the potential to benefit listed species through research and special studies or through resource management actions aimed at rehabilitating seashore habitats that have been affected by historic land uses and invasive species. For this analysis, it is assumed that the NPS – in cooperation with the U.S. Fish and Wildlife Service and the NOAA Fisheries – will continue to undertake active management programs to inventory, monitor, restore, and maintain listed species' habitats; control detrimental nonnative species;

manage detrimental visitor access; and manage habitat to maintain and enhance its value for the recovery of listed species.

The resource specific context for assessing impacts of the alternatives on threatened or endangered within the seashore's habitats includes:

- Beaches and overwash areas on the seashore provide habitat needed to maintain and enhance the recovery of piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) – two federally listed threatened species that are fundamental to the seashore's purpose and significance.
- Nearshore ocean waters within the seashore boundary are known to be used on occasion by three endangered whale species, three endangered sea turtle species, and one threatened sea turtle species. The threatened Atlantic loggerhead sea turtle (*Caretta caretta)* occasionally nests on the seashore's beaches; single event nesting by the endangered leatherback turtle (*Dermachelys coriacea*) and the endangered green sea turtle (*Chelonia mydas*) have also been documented.
- Significant impacts to the seashore's geomorphology and wildlife habitats – including beaches and overwash areas used by piping plovers (*Charadrius melodus*), seabeach amaranth (*Amaranthus pumilus*), and occasional nesting turtles – include the hard stabilization of the Ocean City Inlet, the construction of an artificial protective dune along much of the island in 1962 following a major coastal storm, and the creation of an emergency storm berm at the north end of the island in 1998 after two storms threatened to breach the island (NPS 2011d). To mitigate the impacts, NPS and the USACE have been engaged in a long-term mechanical sand bypass project to alleviate sand starvation of the island from the stabilized inlet, thereby preventing unnatural, accelerated erosion and roll over.
- Introduced horses and sika deer are non-native species that are stressors to seashore vegetation and wildlife – including piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) – when populations are extreme (NPS 2011d); despite this, sustainable populations of horses and sika deer are desired conditions because visitors highly value the animals as part of the seashore experience. Furthermore, horses are considered resources that are important to the seashore.

### 4.5.2 ALTERNATIVE 1 – CONTINUATION OF CURRENT MANAGEMENT

- **Impact Analysis**

**Coastal Response Management Actions.** Dune maintenance to protect visitor facilities and seashore infrastructure in the Maryland Island Developed Area would continue to prevent the natural processes of sand overwash. This would continue to prevent evolution of sparsely vegetated overwash areas that could provide habitat for piping

plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) within the developed area.

Facilities lost or damaged by natural coastal processes or the effects of climate change/sea level rise would be replaced or repaired, if funding is available. Facilities to be replaced would be moved back from the shoreline and made more sustainable in form and function, at sites that would continue to be protected by investment in dune maintenance. Replacement facilities would be located in areas where dune maintenance would continue (as noted above) where sparsely vegetated overwash areas that could provide habitat for piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) do not occur, resulting in no additional adverse impact on threatened and endangered species.

Altered sand transport processes at Ocean City Inlet would continue to be mitigated in collaboration with the USACE. This would benefit threatened and endangered species by alleviating sand starvation of the island (from the stabilized inlet) and indirectly helping to maintain existing sparsely vegetated overwash areas and to create new overwash areas needed by piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*).

**Natural Resource Management Actions.** Ongoing research by the NPS and others would continue to benefit threatened and endangered species. These efforts would continue to monitor plover nesting success and occurrences of seabeach amaranth (*Amaranthus pumilus*) and to conduct studies needed to protect better both species from impacts of visitor use and the effects of climate change/sea level rise.

Management actions would continue to restore island habitats altered by historic land use, including removal of six hunting lodges, two private residences, access roads, and water impoundments in the seashore's backcountry. Structures and other impervious surfaces would be removed and sites rehabilitated to foster a return to natural conditions. These actions would not affect habitat used by threatened and endangered species.

Filling mosquito ditches in the Maryland portion of the seashore would continue. Currently, the seashore has filled about 10 percent of its 48,000 meters of mosquito ditches. Continued ditch restoration would have a beneficial impact on saltmarsh vegetation by helping to restore natural surface and groundwater flows from the island to the bayside and tidal flows in and out of saltmarshes. These actions would not affect habitat used by threatened and endangered species.

*Phragmites australis* removal from saltmarsh, forest and shrubland, inland wetlands, and dunes and grassland would continue using a combination of standard, ground-based control methods in combination with aerial spraying and prescribed fire or

mowing as needed in heavily infested areas. These actions would not affect habitat used by threatened and endangered species.

Horse management would continue with the goal of reducing the feral horse population to a sustainable population of 80 to 100 individuals. This would benefit threatened and endangered species by reducing overgrazing in sparsely vegetated overwash areas where seabeach amaranth (*Amaranthus pumilus*) and piping plovers (*Charadrius melodus*) are present and by reducing trampling of nests and chicks by grazing horses. NPS would also continue to use cages to protect seabeach amaranth (*Amaranthus pumilus*) from horse grazing and trampling.

Hunting management would continue to benefit the seashore's threatened and endangered species by reducing the size of the non-native sika deer and white-tailed deer population to levels which would contain impacts on seabeach amaranth (*Amaranthus pumilus*) and habitat of piping plovers (*Charadrius melodus*). A new hunting monitoring program would enhance management of both sika deer and native white-tailed deer by providing information needed to develop deer density and deer herbivory indices that would inform management decisions aimed at protecting native plant and wildlife species, such as seabeach amaranth (*Amaranthus pumilus*) and piping plovers (*Charadrius melodus*). If access to the OSV area is lost, access for public hunting could be significantly reduced or lost and deer populations could increase potential adverse impacts to seabeach amaranth (*Amaranthus pumilus*) and habitat of piping plovers (*Charadrius melodus*). NPS would explore alternative public hunting strategies to manage deer populations.

**Cultural Resource Management Actions.** NPS efforts to identify, manage, and protect cultural resources would continue. When historic structures could no longer be protected from natural coastal processes and the impacts of climate change/sea level rise, they would be demolished and the sites restored to foster a return to natural conditions. Should the Assateague Beach U.S. Coast Guard Station by subject to these actions, measures would be taken to protect seabeach amaranth (*Amaranthus pumilus*) and piping plovers (*Charadrius melodus*) from disturbance, if present in overwash areas adjoining the site at that time.

At the Assateague Beach U.S. Coast Guard Station, boat dock repairs would not impact threatened and endangered species. Restoration of electrical service would require trenching for conduit installation from the Tom's Cove recreational beach to the station in overwash areas where piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) could be present. Actions would be taken during project design and planning to avoid impacts to threatened and endangered species. Construction would not occur when plovers are present in the area, generally from April through October. Areas disturbed by construction would be revegetated to foster a return to natural conditions.

**Visitor Use and Visitor Experience Management Actions.** Confinement of oversand vehicle use within the existing designated OSV use area would continue to limit the area within which potential adverse impacts could occur to piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) on the intertidal beach and in overwash gaps in the dunes. NPS would continue to close portions of the OSV use area, as appropriate, when plover nesting occurs within the OSV use area. NPS would continue to use cages, signs, and marking to protect seabeach amaranth (*Amaranthus pumilus*) from disturbance by visitors. If vehicular access is lost, and the breach management plan recommends that the breach remain open, there would be a beneficial impact to threatened or endangered species because vehicles would be eliminated from part or all of the OSV use area.

**Seashore Operations Management Actions.** Based on analysis of historic visitation counts, seashore visitation in Maryland is expected to increase by approximately 8,000 visitors per year as long as there is vehicular access to the seashore. The majority of this growth will be in day-use visitors, as campgrounds are already at capacity most days during the peak summer season. Additional visitors would require increased monitoring of seabeach amaranth (*Amaranthus pumilus*) and piping plover (*Charadrius melodus*) occurrences year-round in order to prevent loss because of human interactions or vehicles, disturbances due to noise and human activity, and changed habitat conditions such as trampling, soil compaction, vegetation loss, and loss of food sources damaged or killed by human activity. More visitors would likely use the OSV use area during the off season, when capacity for additional visitation remains, with the potential for additional adverse impacts to seabeach amaranth (*Amaranthus pumilus*) and piping plover (*Charadrius melodus*) habitat during that period.

Development of 20 bedrooms of seasonal housing in Maryland and 17 bedrooms of seasonal housing in Virginia would not affect habitat of piping plovers (*Charadrius melodus*) or seabeach amaranth (*Amaranthus pumilus*).

Withdrawals from wells to meet the daily visitor and NPS employee demands for water would not affect habitat of piping plovers (*Charadrius melodus*) or seabeach amaranth (*Amaranthus pumilus*).

Miscellaneous repairs would be made to the seashore's headquarters complex, visitor use facilities, seashore operations facilities, roads, and trails. These actions would generally not occur in habitats where piping plovers (*Charadrius melodus*) or seabeach amaranth (*Amaranthus pumilus*) are present. When maintenance is planned in areas where these species could be present, actions would be taken to avoid impacts through site design and/or timing of construction.

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have the potential to impact threatened and endangered species include sand transport projects, sediment dredging projects, and actions by the US FWS implementing the comprehensive conservation plan for Chincoteague National Wildlife Refuge. Some habitats of threatened and endangered species are also affected by actions within the coastal bays watershed that have the potential to impact water quality (see section 4.2.2) and by land uses within and outside the region that adversely impact air quality, contributing to high levels of ozone and atmospheric deposition of nitrogen at the seashore.

The overall cumulative impacts on federally listed threatened or endangered species would be primarily beneficial because of improvements to the overall condition of seashore habitats because of collaborative efforts by public agencies, local governments, and non-profit partners to reduce water pollutant loads from point and non-point sources throughout the coastal bay watersheds, and because of national programs to enhance air quality which help to reduce ozone and atmospheric deposition of nitrogen. Alternative 1 would add a noticeable increment to the overall beneficial cumulative impact through continuation of natural resource management actions that restore island habitats altered by historic land use and mosquito ditching, remove invasive *Phragmites australis*, manage horses to reduce impacts to habitats, and continue to reduce deer populations through managed hunting. There would also be adverse cumulative impacts on federally listed threatened or endangered species associated with pollutant discharges from previously permitted and new construction activities and land uses within the watershed, particularly where they occur outside sewer service areas, as well as with continued air quality impacts. Alternative 1 would add an imperceptible adverse increment to the overall adverse cumulative impact due to minor habitat disturbance and clearing for new seashore facilities, and due to annual growth in visitation (as long as there is vehicular access to the island) with the potential to impact adversely habitat and to increase loss of federally listed threatened or endangered species because of human interactions.

- **Conclusions**

In alternative 1 management actions would have both adverse and beneficial impacts on threatened and endangered species and would add an imperceptible adverse increment and a noticeable beneficial increment to the total cumulative adverse and beneficial impacts on federally listed threatened and endangered species, respectively.

Numerous actions associated with alternative 1 would not affect threatened and endangered species because they would occur in areas that do not provide suitable habitat for piping plovers (*Charadrius melodus*) or seabeach amaranth (*Amaranthus pumilus*). Continuation of natural resource management actions to restore island

habitats altered by historic land use would occur in forest, shrubland, and saltmarsh. *Phragmites australis* removal would occur primarily in saltmarsh, forest, shrubland, inland wetlands, and grassland. Similarly, filling of mosquito ditches would occur in saltmarsh habitat not used by piping plovers (*Charadrius melodus*).

Potential adverse impacts on threatened and endangered species could result from several management actions in alternative 1. Dune maintenance to protect visitor facilities and seashore infrastructure in the Maryland Island Developed Area and at the Assateague Beach U.S. Coast Guard Station would continue to prevent evolution of sparse vegetation in overwash areas that could provide habitat for piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*). Growth in visitation, as long as vehicular access to the island exists, would increase the potential for human disturbance in areas where piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) could occur; although in alternative 1 visitor use would generally be concentrated in or near the developed area where piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) do not occur and are not expected to occur as long as fortification continues. OSV use would continue within the existing OSV use area, with potential adverse impacts to plovers and seabeach amaranth (*Amaranthus pumilus*). In the north end, boat access to the beach would continue to enable visitors to use areas for recreation where plovers and seabeach amaranth (*Amaranthus pumilus*) are known to occur. At the Assateague Beach U.S. Coast Guard Station, restoration of electrical service would require trenching through overwash areas where piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) could be present. Impacts to plovers would be mitigated by closures during the nesting period (if plovers are present) and avoidance of construction during the nesting period; impacts to seabeach amaranth (*Amaranthus pumilus*) would be mitigated by use of cages and signage to protect plants from trampling. Reduced or lost access for public hunting via the OSV route (if access is lost), would lead to increased deer populations and associated overgrazing of areas where seabeach amaranth (*Amaranthus pumilus*) could occur or that provide habitat for piping plovers (*Charadrius melodus*). These impacts would not be significant because of the simultaneous implementation of best management practices and continued actions consistent with NPS management policies protecting threatened and endangered species habitats, within the context of threatened and endangered species habitat throughout the seashore.

Beneficial impacts on threatened and endangered species would result from several management actions in alternative 1. The north end Restoration Project and NPS management actions in the north end, aimed at restoring natural overwash processes interrupted by the 1999 emergency storm berm, would continue to facilitate evolution of sparsely vegetated overwash areas providing habitat for piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*). Reducing the feral horse population to a sustainable population of 80 to 100 individuals would better protect

piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) by reducing overgrazing, vegetation trampling, and addition of nutrients. Ongoing research by the NPS and others would continue to monitor plover nesting success and occurrences of seabeach amaranth (*Amaranthus pumilus*) and to conduct studies needed to protect better both species from impacts of visitor use and the effects of climate change/sea level rise. Collectively, the beneficial impacts would be significant and long-term because they would benefit threatened and endangered species that are fundamental to the seashore and would address significant threats to those species within the context of the threatened and endangered species throughout the seashore.

### 4.5.3 IMPACTS COMMON TO ALL ACTION ALTERNATIVES

- **Impact Analysis**

**Coastal Response Management Actions**. As in alternative 1, under alternatives 2, 3, and 4, facilities lost or damaged by natural coastal processes or the effects of climate change/sea level rise would be replaced or repaired, if funding is available, consistent with the underlying principles of each alternative. While the timing and extent to which facilities would continue to be replaced would vary in alternatives 2, 3, and 4, the nature of the impacts on threatened and endangered species associated with replacement would be similar to those described for alternative 1 (section 4.5.2).

**Visitor Use and Visitor Experience Management Actions.** Until facilities are lost, NPS would generally increase visitor services within the Maryland Island Developed Area. A few new small structures (with parking) would be added to support commercial services within existing previously disturbed visitor use areas. These facilities would be located in areas where dune maintenance would continue, where sparsely vegetated overwash areas that could provide habitat for piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) do not occur, and where existing visitor activity creates unsuitable conditions for these species.

The former visitor center on the mainland would be rehabilitated as a stand-alone environmental education center. Rehabilitation of this facility would not affect habitat of piping plovers (*Charadrius melodus*) or seabeach amaranth (*Amaranthus pumilus*); human activity associated its operation would not disturb either species.

**Seashore Operations Management Actions.** In collaboration with MD DNR, NPS would develop a new seashore entrance station on the mainland, requiring realignment and widening of MD 611, construction of entrance booths, and addition of employee parking spaces. Construction of this facility would not affect habitat of piping plovers (*Charadrius melodus*) or seabeach amaranth (*Amaranthus pumilus*); human activity associated its operation would not disturb either species.

Development of a mainland-based alternative transportation system (ATS) would require development of a shuttle staging area and associated unpaved parking area (for approximately 360 cars) on the mainland and shelters and paved pull-offs at three shuttle stops along existing roads on the island. These facilities would be located in areas where dune maintenance would continue, where sparsely vegetated overwash areas that could provide habitat for piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) do not occur, and where existing visitor activity creates unsuitable conditions for these species.

Non-structural stabilization of the mainland shoreline near the visitor center would not affect habitat of piping plovers (*Charadrius melodus*) or seabeach amaranth (*Amaranthus pumilus*).

### 4.5.4 ALTERNATIVE 2 – CONCENTRATED TRADTIONAL BEACH RECREATION

- **Impact Analysis**

**Coastal Response Management Actions.** Artificial dune fortification and beach nourishment would protect the Maryland Island Developed Area from the effects of natural coastal processes and climate change/sea level rise as long as suitable land base exists and funding is available. The seashore would expand partnerships with the USACE to provide additional sand to provide additional sand to mitigate the erosional forces associated with storms and/or sea level rise. Seabeach amaranth (*Amaranthus pumilus*) and piping plovers (*Charadrius melodus*) currently do not occur near where these actions are proposed due to lack of suitable habitat and human activity. Piping plovers (*Charadrius melodus*) or seabeach amaranth (*Amaranthus pumilus*) would not be affected, except to the extent that fortification would continue to prevent evolution of overwash areas where these species might otherwise potentially find suitable habitat.

As land and facilities are lost, they would be rebuilt using more sustainable design within the remaining protected developed area, concentrating visitor use and facilities within a smaller area. Seabeach amaranth (*Amaranthus pumilus*) and piping plovers (*Charadrius melodus*) would not likely occur near where these actions are proposed due to lack of suitable habitat and the existing concentration of human activity.

**Natural Resource Management Actions.** As in alternative 1, ongoing research by the NPS and others would continue to benefit threatened and endangered species. These efforts would continue to monitor plover nesting success and occurrences of seabeach amaranth (*Amaranthus pumilus*) and to conduct studies needed to protect better both species from impacts of visitor use and the effects of climate change/sea level rise.

Natural resource management programs and activities would continue as in alternative 1 although over time their scope would diminish. Filling mosquito ditches in the Maryland portion of the seashore would likely diminish, reducing benefits to the health

and function of saltmarsh habitat and with less benefit to wildlife inhabiting bay subtidal and mudflat habitats accruing from bay water quality enhancements due to reducing nutrient export from marshes. These actions would not affect habitat used by threatened and endangered species.

Reduced scope of other natural resource management actions – such as *Phragmites australis* removal, other vegetation restoration and protection, and beach and bayside wetlands protection – would reduce current benefits from those actions to wildlife inhabiting most seashore habitats. These actions would not affect habitat used by threatened and endangered species.

Reduced access to the north end by eliminating high density use in the north end would benefit piping plovers and seabeach amaranth by reducing the number of visitors in an area of the seashore where the species are known to occur.

As in alternative 1, hunting management would continue to benefit the seashore's threatened and endangered species by reducing the size of the non-native sika deer and white-tailed deer population to levels which would contain impacts on plant species native to the seashore's forest and shrubland habitat, and a new hunting monitoring program would better inform management decisions aimed at protecting native plant and wildlife species, such as seabeach amaranth (*Amaranthus pumilus*) and piping plovers (*Charadrius melodus*). In alternative 2, the benefits of public hunting to native plant and wildlife species, such as seabeach amaranth (*Amaranthus pumilus*) and piping plovers (*Charadrius melodus*) would be reduced because the OSV area would be smaller, making access to the backcountry more difficult for hunters with that result fewer deer would be taken annually. If access to the OSV area is lost, no action would be taken to restore it; access for public hunting could be significantly reduced or lost and deer populations could increase with potential adverse impacts on on wildlife due to adverse impacts on their habitat. NPS would explore alternative public hunting strategies to manage deer populations.

Working with Virginia to ensure appropriate wastewater treatment and disposal at privately owned structures (oyster watch houses and hunting blinds) located within the seashore's Virginia waters would reduce discharge of nutrients, pathogens, and other contaminants into bay waters, resulting in a beneficial impact to wildlife inhabiting bay subtidal and mudflat habitats. These actions would not affect habitat used by threatened and endangered species.

**Cultural Resource Management Actions.** NPS efforts to identify, manage, and protect cultural resources would continue. When historic structures could no longer be protected from natural coastal processes and the impacts of climate change/sea level rise, they would be demolished and the sites restored to foster a return to natural conditions. Should the Assateague Beach U.S. Coast Guard Station by subject to these

actions, measures would be taken to protect seabeach amaranth (*Amaranthus pumilus*) and piping plovers (*Charadrius melodus*) from disturbance, if present in overwash areas adjoining the site at that time.

**Visitor Use and Visitor Experience Management Actions.** OSV use would be confined within a smaller designated OSV use area (extending south of the Maryland Island Developed Area to approximately KM 23.4). Confinement within this smaller area would further limit the area within which adverse impacts occur to piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) on the intertidal beach and in overwash gaps in the dunes. As in alternative 1, NPS would continue to use cages, signs, and marking to protect seabeach amaranth (*Amaranthus pumilus*) from disturbance by visitors. If vehicular access is lost, and the breach management plan recommends that the breach remain open, there would be a beneficial impact to threatened or endangered species because vehicles would be eliminated from part or all of the OSV use area.

**Seashore Operations Management Actions.** Seashore operations would be based in a rehabilitated headquarters complex in the Maryland Mainland Developed Area. Rehabilitation of this facility would not affect habitat of piping plovers (*Charadrius melodus*) or seabeach amaranth (*Amaranthus pumilus*); continued human activity associated its operation would not disturb either species.

Approximately 10 acres would be acquired near the existing seashore headquarters complex to develop a shuttle staging area and associated visitor unpaved parking area (for approximately 360 cars). Construction of this facility would not affect habitat of piping plovers (*Charadrius melodus*) or seabeach amaranth (*Amaranthus pumilus*); human activity associated its operation would not disturb either species.

Electricity and potable water would be extended to approximately 90 existing campsites. During construction trenching for underground installation of lines, noise and human activity would disturb wildlife. The impact area would generally be in previously disturbed areas along the edges of existing seashore roads, where noise and human activity levels are already high. Utility installations would not affect habitat of piping plovers (*Charadrius melodus*) or seabeach amaranth (*Amaranthus pumilus*).

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have impacts on threatened and endangered species would be the same as those identified for alternative 1.

The overall cumulative impacts on federally listed threatened or endangered species would be primarily beneficial because of improvements to the overall condition of seashore habitats because of collaborative efforts by public agencies, local

governments, and non-profit partners to reduce water pollutant loads from point and non-point sources throughout the coastal bay watersheds, and because of national programs to enhance air quality which help to reduce ozone and atmospheric deposition of nitrogen. Alternative 2 would add a noticeable increment to the overall beneficial cumulative impact through continuation of natural resource management actions that restore island habitats altered by historic land use and mosquito ditching, remove invasive *Phragmites australis*, manage horses to reduce impacts to habitats, and continue to reduce deer populations through managed hunting. There would also be adverse cumulative impacts on federally listed threatened or endangered species associated with pollutant discharges from previously permitted and new construction activities and land uses within the watershed, particularly where they occur outside sewer service areas, as well as with continued air quality impacts. Alternative 2 would add an imperceptible adverse increment to the overall adverse cumulative impact due to habitat disturbance and clearing for new seashore facilities, and due to annual growth in visitation (as long as there is vehicular access to the island) with the potential to impact adversely habitat and to increase loss of federally listed threatened or endangered species because of human interactions.

- **Conclusions**

In alternative 2 management actions would have both adverse and beneficial impacts on threatened and endangered species and would add an imperceptible adverse increment and a noticeable beneficial increment to the total cumulative adverse and beneficial impacts on federally listed threatened and endangered species, respectively.

Numerous actions associated with alternative 2 would not affect threatened and endangered species because they would occur in areas that do not provide suitable habitat for piping plovers (*Charadrius melodus*) or seabeach amaranth (*Amaranthus pumilus*). Development of new seashore facilities, most repairs to existing facilities, and replacement of existing facilities damaged or lost by natural coastal processes and/or the effects of climate change/sea level rise would occur on the mainland or on sites within the Maryland Island Developed Area in forest, shrubland, and grassland habitat. Continuation of natural resource management actions to restore island habitats altered by historic land use would occur in forest, shrubland, and saltmarsh. *Phragmites australis* removal would occur primarily in saltmarsh, forest, shrubland, inland wetlands, and grassland. Similarly, filling of mosquito ditches would occur in saltmarsh habitat, and stabilization of the shoreline near the new visitor center would occur in bay subtidal and mudflat habitat, all habitats that are not used by piping plovers (*Charadrius melodus*) or seabeach amaranth (*Amaranthus pumilus*).

Potential adverse impacts on threatened and endangered species could result from several management actions in alternative 2. Fortification of the Maryland Island Developed Area and dune maintenance to protect visitor facilities and seashore infrastructure in the Maryland Island Developed Area would continue to prevent

evolution of sparse vegetation in overwash areas that could provide habitat for piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*). Growth in visitation, as long as vehicular access to the island exists, would increase the potential for human disturbance in areas where piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) could occur; although in alternative 2 visitor use would become increasingly concentrated within the developed area where piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) do not occur and are not expected to occur as long as fortification continues and actually intensifies. OSV use would continue within a reduced OSV use area, with continued potential adverse impacts to plovers and seabeach amaranth (*Amaranthus pumilus*) although within a smaller area. In the north end, boat access to the beach would continue to enable visitors to use areas for recreation where plovers and seabeach amaranth (*Amaranthus pumilus*) are known to occur. As in alternative 1, at the Assateague Beach U.S. Coast Guard Station, restoration of electrical service would require trenching through overwash areas where piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) could be present. Impacts to piping plovers (*Charadrius melodus*) would be mitigated by closures during the nesting period (if plovers are present) and avoidance of construction during the nesting period; impacts to seabeach amaranth (*Amaranthus pumilus*) would be mitigated by use of cages and signage to protect plants from trampling. Reduced or lost access for public hunting via the OSV route (if access is lost), would lead to increased deer populations and associated overgrazing of areas where seabeach amaranth (*Amaranthus pumilus*) could occur or that provide habitat for piping plovers (*Charadrius melodus*). These impacts would not be significant because of the simultaneous implementation of best management practices and continued actions consistent with NPS management policies protecting threatened and endangered species habitats, within the context of threatened and endangered species habitat throughout the seashore.

Beneficial impacts on threatened and endangered species would result from several management actions in alternative 2. OSV use would continue within a smaller OSV use area, benefitting piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) by reducing the area of potential adverse impacts associated with OSV use on the intertidal beach and in overwash gaps in the dunes where these species occur. Limiting use of the north end beach would reduce the number of visitors in the habitat areas of these species. The north end Restoration Project and NPS management actions in the north end, aimed at restoring natural overwash processes interrupted by the 1999 emergency storm berm, would continue to facilitate evolution of sparsely vegetated overwash areas providing habitat for piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*). Reducing the feral horse population to a sustainable population of 80 to 100 individuals would better protect piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) by reducing overgrazing, vegetation trampling, and addition of nutrients. Ongoing research by the NPS and others would continue to monitor plover nesting success and occurrences of

seabeach amaranth (*Amaranthus pumilus*) and to conduct studies needed to protect better both species from impacts of visitor use and the effects of climate change/sea level rise. Collectively, the beneficial impacts would be significant and long-term because they would benefit threatened and endangered species that are fundamental to the seashore and would address significant threats to those species within the context of the threatened and endangered species throughout the seashore.

### 4.5.5 ALTERNATIVE 3 – SUSTAINABLE RECREATION AND CLIMATE CHANGE ADAPTATION (NPS PREFERRED ALTERNATIVE)

- **Impact Analysis**

**Coastal Response Management Actions.** Seashore management would allow the island to evolve naturally, relocating and designing new facilities to be more sustainable. The seashore would no longer work with the USACE to provide additional sand to provide additional sand to mitigate the erosional forces associated with storms and/or sea level rise. No new investments would be made in dune fortification through planting and fencing installation. Over time natural overwash would resume throughout the developed area. This would benefit threatened and endangered species by encouraging evolution of sparsely vegetated overwash areas that could provide habitat for piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) within the developed area.

Visitor use infrastructure would evolve to more sustainable designs and likely shift to new, more stable locations initially on the island; over time development on the island would become less intensive, with fewer facilities and less impervious surfaces as visitor use facilities are slowly moved to the mainland. To the maximum extent, facilities would be temporary, designed to be removed in advance of coastal storms. Facilities lost or damaged by natural coastal processes or the effects of climate change/sea level rise would be replaced or repaired, if funding is available, at sites further from the shoreline at sites that do not require continued investment in dune maintenance where they can be made more sustainable in form and function. The location, extent, and type of habitat lost and wildlife species affected would depend on when and where seashore facilities and infrastructure would be lost and replaced. Replacement facilities would generally be located in habitat that is not used by piping plovers (*Charadrius melodus*) or seabeach amaranth (*Amaranthus pumilus*); should there be potential for disturbance, actions would be taken during project design and planning to avoid impacts; construction with the potential to disturb plovers would not occur when plovers are present in the area, generally from April through October. As facilities are relocated, in combination with stopping beach fortification (see above) there would be greater potential for evolution of suitable habitat for piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) within what is now the developed area, due to restoration of overwash processes, removal of visitor use facilities, and less human disturbance.

If bridge access is lost, access would transition to all water access. Beneficial impacts to threatened and endangered species would generally result from removal of most vehicles from the island (with the exception of NPS operations vehicles and beach shuttles) and from removal of 150 campsites, other visitor facilities, paved roads, and the NPS maintenance yard. This would benefit piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) by reducing human activity and associated disturbances, and by fostering a return to natural conditions that promote evolution of habitat that could become suitable for their use in the future.

**Natural Resource Management Actions.** As in alternative 1, ongoing research by the NPS and others would continue to benefit threatened and endangered species. These efforts would continue to monitor plover nesting success and occurrences of seabeach amaranth (*Amaranthus pumilus*) and to conduct studies needed to protect better both species from impacts of visitor use and the effects of climate change/sea level rise. In alternative 3, data from an expanded monitoring network, as well as new ecological research, would provide a significant increase in information needed to better understand conditions, trends, and threats in the seashore's wildlife populations and their habitats, including piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*).

Natural resource management programs and activities would continue as in alternative 1 although over time programs would expand to address issues created by global climate change. In alternative 3, actions would generally seek to enhance resiliency of saltmarshes and inland wetlands resulting in a beneficial impact on the seashore's wildlife populations and their habitats, including piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*).

Reduced access to the north end by implementing a permit system requiring a docking/mooring pass would benefit piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) by reducing the number of visitors in an area of the seashore where the species are known to occur.

As in alternative 1, hunting management would continue to benefit the seashore's threatened and endangered species by reducing the size of the non-native sika deer and white-tailed deer population to levels which would contain impacts on plant species native to the seashore's forest and shrubland habitat, and a new hunting monitoring program would better inform management decisions aimed at protecting native plant and wildlife species, such as seabeach amaranth (*Amaranthus pumilus*) and piping plovers (*Charadrius melodus*). In alternative 3, if access to the OSV area is lost, consideration would be given to modifying the OSV route or relocating it to another more suitable location, thereby maintaining public access for hunting and its beneficial impacts to native plant and wildlife species, such as seabeach amaranth (*Amaranthus pumilus*) and piping plovers (*Charadrius melodus*), by reducing deer populations. Over

time, however, it is possible that access for public hunting could be significantly reduced or lost and deer populations could increase with potential adverse impacts on wildlife due to adverse impacts on their habitat.

Working with Virginia to ensure appropriate wastewater treatment and disposal at privately owned structures (oyster watch houses and hunting blinds) located within the seashore's Virginia waters would reduce discharge of nutrients, pathogens, and other contaminants into bay waters, resulting in a beneficial impact to wildlife inhabiting bay subtidal and mudflat habitats. These actions would not affect habitat used by threatened and endangered species.

Working with Worcester County, Accomack County, and conservation organizations, NPS would support efforts to protect land (through fee simple purchase or conveyance of conservation easements) within the watersheds of Chincoteague Bay and Newport Bay for conservation and climate change adaptation purposes. Conservation of these lands would not affect habitat used by threatened and endangered species.

NPS would collaborate with its conservation partners to acquire approximately 150 to 200 acres of buffer lands adjoining the one to three new points of departure on the Chincoteague Bay mainland in Worcester County. Land conservation would permanently protect these lands from loss to developed land uses; long-term management would facilitate return to natural conditions, as appropriate, with beneficial impacts to wildlife inhabiting a variety of mainland habitats, particularly saltmarsh along the bayshore. Conservation of these lands would not affect habitat used by threatened and endangered species.

**Cultural Resource Management Actions.** Implementation of non-structural storm protection measures (such as dune nourishment and planting) to protect the Assateague Beach U.S. Coast Guard Station would continue to prevent natural processes of sand overwash in the station vicinity. This would continue to prevent evolution of sparsely vegetated overwash areas that could provide habitat for piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) in the coast guard station vicinity.

**Visitor Use and Visitor Experience Management Actions.** Once camping facilities are no longer sustainable in the Maryland Island Developed Area or when vehicular access to the island is lost, NPS would collaborate with MD DNR to develop a new campground on the mainland. Construction of this facility on the mainland would not affect habitat of piping plovers (*Charadrius melodus*) or seabeach amaranth (*Amaranthus pumilus*); human activity associated its operation would not disturb either species. On the island, existing campground sites would be rehabilitated to foster a return to natural conditions. Once this occurs, in combination with stopping beach fortification (see above) there would be greater potential for successful use of land within the developed

area by piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) due to restored overwash and less intense development of visitor facilities within areas that could become suitable for habitat in the future.

As in alternative 1, confinement of oversand vehicle use within the existing designated OSV use area would continue to limit the area within which adverse impacts occur to piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) on the intertidal beach and in overwash gaps in the dunes. NPS would continue to close portions of the OSV use area, as appropriate, when plover nesting occurs within the OSV use area. NPS would continue to use cages, signs, and marking to protect seabeach amaranth (*Amaranthus pumilus*) from disturbance by visitors. If vehicular access is lost, and the breach management plan recommends that the breach remain open, there would be a beneficial impact to threatened or endangered species because vehicles would be eliminated from part or all of the OSV use area.

Expanded use of Egging Island for environmental education would increase visitor use to the island. New facilities would include an expanded soft landing for canoes and kayaks, clearing for a primitive group campsite, and installation of relocatable vault toilets. Construction of this facility on an island in Chincoteague Bay would not affect habitat of piping plovers (*Charadrius melodus*) or seabeach amaranth (*Amaranthus pumilus*); human activity associated its operation would not disturb either species.

Three new bayside access points would be developed to provide water access to existing backcountry campsites and trails, one of which would provide opportunities for access via motorized vessels. Construction of these facilities on the mainland would not affect habitat of piping plovers (*Charadrius melodus*) or seabeach amaranth (*Amaranthus pumilus*); human activity associated its operation would not disturb either species.

On the mainland in Worcester County NPS would seek to acquire from the county two existing points of departure from Chincoteague Bay; the sites would be rehabilitated, as needed, likely including development of a shade shelter and relocatable vault toilet. Rehabilitation of these facilities on the mainland would not affect habitat of piping plovers (*Charadrius melodus*) or seabeach amaranth (*Amaranthus pumilus*); human activity associated its operation would not disturb either species.

**Seashore Operations Management Actions.** Seashore operations would be relocated to a new headquarters complex in the MD 611 corridor near the seashore entrance. Construction of this facility on the mainland would not affect habitat of piping plovers (*Charadrius melodus*) or seabeach amaranth (*Amaranthus pumilus*); human activity associated its operation would not disturb either species.

Approximately 10 acres at the existing seashore headquarters site would be rehabilitated as a shuttle staging area and associated visitor unpaved parking area (for approximately 360 cars). Construction of this facility on the mainland would not affect habitat of piping plovers (*Charadrius melodus*) or seabeach amaranth (*Amaranthus pumilus*); human activity associated its operation would not disturb either species.

When vehicular access to the island is no longer possible, access to the island would shift to a ferry based operation for visitor access and seashore operations at waterfront locations on the mainland and on the island. Construction of the docking facilities would not affect habitat of piping plovers (*Charadrius melodus*) or seabeach amaranth (*Amaranthus pumilus*); human activity associated its operation would not disturb either species. On the island, a new shuttle route from the bayshore to the beach and other island attractions would generally be located in habitat that is not used by piping plovers (*Charadrius melodus*) or seabeach amaranth (*Amaranthus pumilus*); should there be potential for disturbance, actions would be taken during project design and planning to avoid impacts; construction with the potential to disturb plovers would not occur when plovers are present in the area, generally from April through October.

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have impacts on threatened and endangered species would be the same as those identified for alternative 1.

The overall cumulative impacts on federally listed threatened or endangered species would be primarily beneficial because of improvements to the overall condition of seashore habitats because of collaborative efforts by public agencies, local governments, and non-profit partners to reduce water pollutant loads from point and non-point sources throughout the coastal bay watersheds, and because of national programs to enhance air quality which help to reduce ozone and atmospheric deposition of nitrogen. Alternative 3 would add an appreciable increment to the overall beneficial cumulative impact through expansion of natural resource management actions that restore island habitats altered by historic land use and mosquito ditching, remove invasive *Phragmites australis*, manage horses to reduce impacts to habitats, continue to reduce deer populations through managed hunting, and – once access is lost – removal of visitor facilities and reduced visitation. There would also be adverse cumulative impacts on federally listed threatened or endangered species associated with pollutant discharges from previously permitted and new construction activities and land uses within the watershed, particularly where they occur outside sewer service areas, as well as with continued air quality impacts. Alternative 3 would add an imperceptible adverse increment to the overall adverse cumulative impact due to habitat disturbance and clearing for new seashore facilities, and due to annual growth in visitation (as long as there is vehicular access to the island) with the potential to impact

adversely habitat and to increase loss of federally listed threatened or endangered species because of human interactions.

- **Conclusions**

In alternative 3 management actions would have both adverse and beneficial impacts on threatened and endangered species and would add an imperceptible adverse increment and an imperceptible beneficial increment to the total cumulative adverse and beneficial impacts on federally listed threatened and endangered species, respectively.

Numerous actions associated with alternative 3 would not affect threatened and endangered species because they would occur in areas that do not provide suitable habitat for piping plovers (*Charadrius melodus*) or seabeach amaranth (*Amaranthus pumilus*). Development of new seashore facilities, most repairs to existing facilities, and replacement of existing facilities damaged or lost by natural coastal processes and/or the effects of climate change/sea level rise would occur on the mainland or on sites within the Maryland Island Developed Area in forest, shrubland, and grassland habitat. Continuation of natural resource management actions to restore island habitats altered by historic land use would occur in forest, shrubland, and saltmarsh. *Phragmites australis* removal would occur primarily in saltmarsh, forest, shrubland, inland wetlands, and grassland. Similarly, filling of mosquito ditches would occur in saltmarsh habitat, and stabilization of the shoreline near the new visitor center would occur in bay subtidal and mudflat habitat, all habitats that are not used by plovers or amaranth.

Potential adverse impacts on threatened and endangered species could result from several management actions in alternative 3. Dune maintenance to protect the Assateague Beach U.S. Coast Guard Station would continue to prevent evolution of sparse vegetation in overwash areas that could provide habitat for piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*). Growth in visitation, as long as vehicular access to the island exists, would increase the potential for human disturbance in areas where piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) could occur, particularly as fortification ceases and areas within the Maryland Island Developed Area are permitted to evolve naturally, including evolution of habitat suitable for piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*). Once access is lost, island roads and parking would be largely removed, retaining only those needed for seashore operations and for an island visitor shuttle (from the new bayshore ferry dock to the beach); over time, the island could evolve such that these roads could traverse or be near habitat that has become suitable habitat for piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*), resulting in the potential for adverse impacts due to human disturbance. As in alternative 1, OSV use would continue within the existing OSV use area, with potential adverse impacts to plovers and seabeach amaranth (*Amaranthus pumilus*) due to trampling, human activity, noise, and sand compaction. In

the north end, visitors would continue to use areas for recreation where plovers and seabeach amaranth (*Amaranthus pumilus*) are known to occur, although the number of visitors and potential for adverse impacts on the species would be reduced because of implementing a permit system requiring a docking/mooring pass for boats accessing the north end. As in alternative 1, at the Assateague Beach U.S. Coast Guard Station, restoration of electrical service would require trenching through overwash areas where piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) could be present. Impacts to plovers would be mitigated by closures during the nesting period (if plovers are present) and avoidance of construction during the nesting period; impacts to seabeach amaranth (*Amaranthus pumilus*) would be mitigated by use of cages and signage to protect plants from trampling. These impacts would not be significant because of the simultaneous implementation of best management practices and continued actions consistent with NPS management policies protecting threatened and endangered species habitats, within the context of threatened and endangered species habitat throughout the seashore.

Beneficial impacts on threatened and endangered species would result from several management actions in alternative 3. As the island evolves naturally, fortification of the Maryland Island Developed Area would stop, allowing natural coastal processes to resume, including formation of overwash gaps in the dunes and overwash fans, potentially providing additional habitat for piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*). Visitor use facilities would gradually be relocated (as long as vehicle access to the island exists), to more sustainable locations in grasslands and forest habitat where piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) do not occur. Once access is lost, roads, parking areas, and campgrounds would be removed from the developed area and the sites restored to foster return to natural conditions, which as the island evolves naturally, could further foster formation of new habitat suitable for piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*). In the north end, reduced boat access to the beach would limit the number of visitors who using areas for recreation where plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) occur. The north end Restoration Project and NPS management actions in the north end, aimed at restoring natural overwash processes interrupted by the 1999 emergency storm berm, would continue to facilitate evolution of sparsely vegetated overwash areas providing habitat for piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*). Reducing the feral horse population to a sustainable population of 80 to 100 individuals would better protect piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) by reducing overgrazing, vegetation trampling, and addition of nutrients. Expanded research by the NPS and others would increase monitoring of piping plover (*Charadrius melodus*) nesting success and occurrences of seabeach amaranth (*Amaranthus pumilus*) and more studies would occur that enhance understanding of management needs to protect better both species from impacts of visitor use and the effects of climate change/sea level rise. Collectively, the beneficial

impacts would be significant and long-term because they would benefit threatened and endangered species that are fundamental to the seashore and would address significant threats to those species within the context of the threatened and endangered species throughout the seashore.

### 4.5.6 ALTERNATIVE 4 – NATURAL ISLAND EVOLUTION AND A PRIMITIVE ISLAND EXPERIENCE

- **Impact Analysis**

**Coastal Response Management Actions.** Seashore management would allow the island to evolve naturally, maintaining facilities only until they are lost, severely damaged, or become obsolete. As in alternative 3, the seashore would no longer work with the USACE to provide additional sand to provide additional sand to mitigate the erosional forces associated with storms and/or sea level rise. No new investments would be made in dune fortification through planting and fencing installation. Over time natural overwash would resume throughout the developed area. This would benefit threatened and endangered species by encouraging evolution of sparsely vegetated overwash areas that could provide habitat for piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) within the developed area.

Development on the island would become less intensive, with fewer facilities and less impervious surfaces as visitor use facilities are removed, resulting in a beneficial impact on threatened and endangered species. Replacement of facilities lost or damaged would be limited to new primitive campsites; should there be potential for disturbance, actions would be taken during project design and planning to avoid impacts; construction with the potential to disturb plovers would not occur when plovers are present in the area, generally from April through October. As facilities are relocated, in combination with stopping beach fortification (see above) there would be greater potential for evolution of suitable habitat for piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) within what is now the developed area, due to restoration of overwash processes, removal of visitor use facilities, and less human disturbance.

As in alternative 3, if bridge access is lost, access would transition to all water access. Beneficial impacts to threatened and endangered species would generally result from removal of most vehicles from the island (with the exception of NPS operations vehicles and beach shuttles) and from removal of 150 campsites, other visitor facilities, paved roads, and the NPS maintenance yard. This would benefit piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) by reducing human activity and associated disturbances, and by fostering a return to natural conditions that promote evolution of habitat that could become suitable for their use in the future.

**Natural Resource Management Actions.** Natural resource management programs and activities would continue as in alternative 1 although over time programs would expand to address mitigation of human impacts and climate change adaptation. These efforts would continue to monitor plover nesting success and occurrences of seabeach amaranth (*Amaranthus pumilus*) and to conduct studies needed to protect better both species from impacts of visitor use and the effects of climate change/sea level rise. In alternative 4, monitoring key climate drivers and resource conditions would increase. Collectively these expanded programs would support actions to enhance resiliency of vulnerable resources resulting in a beneficial impact on the seashore's wildlife populations and their habitats, including piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*).

Visitor use impacts on piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) in the north end would be largely eliminated by prohibiting boat-in visitor use to the area. This would have a beneficial impact on both species because most visiotrs who now access the area by boat would no longer be able or willing to do so. In the future, only visitors willing to hike or paddle the distance to the north end will visit the area. This will significantly reducing the potential for adverse impacts to piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*).

Expanded cooperative research would include more basic science and barrier island ecology research. New ecological research, would provide additional in information needed to better understand habitat conditions, trends, and management issues that could help accomplish management goals for piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*).

As in alternative 1, hunting management would continue to benefit the seashore's threatened and endangered species by reducing the size of the non-native sika deer and white-tailed deer population to levels which would contain impacts on plant species native to the seashore's forest and shrubland habitat, and a new hunting monitoring program would better inform management decisions aimed at protecting native plant and wildlife species, such as seabeach amaranth (*Amaranthus pumilus*) and piping plovers (*Charadrius melodus*). In alternative 4, if access to the OSV area is lost, no action would be taken to restore it; access for public hunting could be significantly reduced or lost and deer populations could increase with potential adverse impacts on native plant and wildlife species, such as seabeach amaranth (*Amaranthus pumilus*) and piping plovers (*Charadrius melodus*). NPS would explore alternative public hunting strategies to manage deer populations.

As in alternative 3, working with Worcester County, Accomack County, and conservation organizations, NPS would support efforts to protect land (through fee simple purchase or conveyance of conservation easements) within the watersheds of Chincoteague Bay and Newport Bay for conservation and climate change adaptation purposes.

Conservation of these lands would not affect habitat used by threatened and endangered species.

**Cultural Resource Management Actions.** As in alternative 3, implementation of non-structural storm protection measures (such as dune nourishment and planting) to protect the Assateague Beach U.S. Coast Guard Station would continue to prevent natural processes of sand overwash in the station vicinity. This would continue to prevent evolution of sparsely vegetated overwash areas that could provide habitat for piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) in the coast guard station vicinity.

**Visitor Use and Visitor Experience Management Actions.** New facility development would include development of up to 150 primitive campsites, replacing developed campsites lost to natural coastal processes and the impacts of climate change/sea level rise. Campsites would be located in habitat that is not used by piping plovers (*Charadrius melodus*) or seabeach amaranth (*Amaranthus pumilus*); should there be potential for disturbance, actions would be taken during project design and planning to avoid impacts; construction with the potential to disturb plovers would not occur when plovers are present in the area, generally from April through October.

As in alternative 1, confinement of oversand vehicle use within the existing designated OSV use area would continue to limit the area within which potential adverse impacts could occur to piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) on the intertidal beach and in overwash gaps in the dunes. NPS would continue to close portions of the OSV use area, as appropriate, when plover nesting occurs within the OSV use area. NPS would continue to use cages, signs, and marking to protect seabeach amaranth (*Amaranthus pumilus*) from disturbance by visitors. If vehicular access is lost, and the breach management plan recommends that the breach remain open, there would be a beneficial impact to threatened or endangered species because vehicles would be eliminated from part or all of the OSV use area.

**Seashore Operations Management Actions.** As in alternative 3, seashore operations would be relocated to a new headquarters complex in the MD 611 corridor near the seashore entrance. Construction of this facility on the mainland would not affect habitat of piping plovers (*Charadrius melodus*) or seabeach amaranth (*Amaranthus pumilus*); human activity associated its operation would not disturb either species.

As in alternative 3, approximately 10 acres at the existing seashore headquarters site would be rehabilitated as a shuttle staging area and associated visitor unpaved parking area (for approximately 360 cars). Construction of this facility on the mainland would not affect habitat of piping plovers (*Charadrius melodus*) or seabeach amaranth

(*Amaranthus pumilus*); human activity associated its operation would not disturb either species.

As in alternative 3, when vehicular access to the island is no longer possible, access to the island would shift to a ferry based operation for visitor access and seashore operations at waterfront locations on the mainland and on the island. Construction of the docking facilities would not affect habitat of piping plovers (*Charadrius melodus*) or seabeach amaranth (*Amaranthus pumilus*); human activity associated its operation would not disturb either species. On the island, a new shuttle route from the bayshore to the beach and other island attractions would generally be located in habitat that is not used by piping plovers (*Charadrius melodus*) or seabeach amaranth (*Amaranthus pumilus*); should there be potential for disturbance, actions would be taken during project design and planning to avoid impacts; construction with the potential to disturb plovers would not occur when piping plovers (*Charadrius melodus*) are present in the area, generally from April through October.

Removal of the existing maintenance yard in the Maryland Island Developed Area and rehabilitation of the site to foster a return to natural conditions would not affect piping plovers (*Charadrius melodus*) or seabeach amaranth (*Amaranthus pumilus*).

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have impacts on threatened and endangered species would be the same as those identified for alternative 1.

The overall cumulative impacts on federally designated or endangered species would be primarily beneficial because of improvements to the overall condition of seashore habitats because of collaborative efforts by public agencies, local governments, and non-profit partners to reduce water pollutant loads from point and non-point sources throughout the coastal bay watersheds, and because of national programs to enhance air quality which help to reduce ozone and atmospheric deposition of nitrogen. Alternative 4 would add an appreciable increment to the overall beneficial cumulative impact through expansion of natural resource management actions that restore island habitats altered by historic land use and mosquito ditching, remove invasive *Phragmites australis*, manage horses to reduce impacts to habitats, continue to reduce deer populations through managed hunting, and – once access is lost – removal of visitor facilities and reduced visitation. There would also be adverse cumulative impacts on federally listed threatened or endangered species associated with pollutant discharges from previously permitted and new construction activities and land uses within the watershed, particularly where they occur outside sewer service areas, as well as with continued air quality impacts. Alternative 4 would add an imperceptible adverse increment to the overall adverse cumulative impact due to habitat disturbance and clearing for new seashore facilities, and due to annual growth in visitation (as long as

there is vehicular access to the island) with the potential to impact adversely habitat and to increase loss of federally listed threatened or endangered species because of human interactions.

- **Conclusions**

In alternative 4 management actions would have both adverse and beneficial impacts on threatened and endangered species and would add an imperceptible adverse increment and a noticeable beneficial increment to the total cumulative adverse and beneficial impacts on federally listed threatened and endangered species, respectively.

Development of new seashore facilities, most repairs to existing facilities, and replacement of existing facilities damaged or lost by natural coastal processes and/or the effects of climate change/sea level rise would occur on the mainland or on sites within the Maryland Island Developed Area in forest, shrubland, and grassland habitat. Continuation of natural resource management actions to restore island habitats altered by historic land use would occur in forest, shrubland, and saltmarsh. *Phragmites australis* removal would occur primarily in saltmarsh, forest, shrubland, inland wetlands, and grassland. Similarly, filling of mosquito ditches would occur in saltmarsh habitat, and stabilization of the shoreline near the new visitor center would occur in bay subtidal and mudflat habitat, all habitats that are not used by plovers or amaranth.

Potential adverse impacts on threatened and endangered species could result from several management actions in alternative 4. Dune maintenance to protect the Assateague Beach U.S. Coast Guard Station would continue to prevent evolution of sparse vegetation in overwash areas that could provide habitat for piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*). Growth in visitation, as long as vehicular access to the island exists, would increase the potential for human disturbance in areas where piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) could occur, particularly as fortification ceases and areas within the Maryland Island Developed Area are permitted to evolve naturally, including evolution of habitat suitable for piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*). Once access is lost, island roads and parking would be largely removed, retaining only those needed for seashore operations; over time, the island could evolve such that these seashore roads could traverse or be near habitat that has become suitable habitat for piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*), resulting in the potential for adverse impacts due to human disturbance. Replacement of developed campgrounds with up to 150 primitive campsites would have the potential to impact piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) if any campsites are located in areas where habitat conditions have evolved to create potential habitat for piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*). As in alternative 1, OSV use would continue within the existing OSV use area, with potential adverse impacts to piping plovers (*Charadrius melodus*) and seabeach amaranth

(*Amaranthus pumilus*) due to trampling, human activity, noise, and sand compaction. In the north end, visitors would continue to use areas for recreation where plovers and seabeach amaranth (*Amaranthus pumilus*) are known to occur, although the number of visitors and potential for adverse impacts on the species would be greatly reduced by no longer allowing boat access to the north end. As in alternative 1, at the Assateague Beach U.S. Coast Guard Station, restoration of electrical service would require trenching through overwash areas where piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) could be present. Impacts to plovers would be mitigated by closures during the nesting period (if plovers are present) and avoidance of construction during the nesting period; impacts to seabeach amaranth (*Amaranthus pumilus*) would be mitigated by use of cages and signage to protect plants from trampling. Reduced or lost access for public hunting via the OSV route (if access is lost), would lead to increased deer populations and associated overgrazing of areas where seabeach amaranth (*Amaranthus pumilus*) could occur or that provide habitat for piping plovers (*Charadrius melodus*). These impacts would not be significant because of the simultaneous implementation of best management practices and continued actions consistent with NPS management policies protecting threatened and endangered species habitats, within the context of threatened and endangered species habitat throughout the seashore.

Beneficial impacts on threatened and endangered species would result from several management actions in alternative 4. As the island evolves naturally, fortification of the Maryland Island Developed Area would stop, allowing natural coastal processes to resume, including formation of overwash gaps in the dunes and overwash fans, potentially providing additional habitat for piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*). Visitor use facilities would gradually be relocated (as long as vehicle access to the island exists), to more sustainable locations in grasslands and forest habitat where piping plover (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) do not occur. Once access is lost, roads, parking areas, and campgrounds would be removed from the developed area and the sites restored to foster return to natural conditions, which as the island evolves naturally, could further foster formation of new habitat suitable for piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*). In the north end, boat access to the beach would no longer be permitted, thereby reducing the number of visitors who using areas for recreation where plovers and seabeach amaranth (*Amaranthus pumilus*) occur. The north end Restoration Project and NPS management actions in the north end, aimed at restoring natural overwash processes interrupted by the 1999 emergency storm berm, would continue to facilitate evolution of sparsely vegetated overwash areas providing habitat for piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*). Reducing the feral horse population to a sustainable population of 80 to 100 individuals would better protect piping plovers (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) by reducing overgrazing, vegetation trampling, and addition of nutrients. Expanded research by the NPS and others would increase

monitoring of plover nesting success and occurrences of seabeach amaranth (*Amaranthus pumilus*) and more studies would occur that enhance understanding of management needs to protect better both species from impacts of visitor use and the effects of climate change/sea level rise. Collectively, the beneficial impacts would be significant and long-term because they would benefit threatened and endangered species that are fundamental to the seashore and would address significant threats to those species within the context of the threatened and endangered species throughout the seashore.

## 4.6 Historic Structures

### 4.6.1 METHODOLOGY FOR ANALYZING IMPACTS

Impacts on historic structures are described in terms consistent with the Council on Environmental Quality (CEQ) regulations for implementing the National Environmental Policy Act (NEPA) that require that the impacts of the alternatives and their component actions be disclosed. The analysis of individual actions includes identification and characterization of impacts, including a discussion of the type of impact (beneficial or adverse), duration (short-term, long-term, or permanent), and significance.

The planning team based its impact analysis and conclusions largely on the review of existing research and studies and the professional judgment of Assateague Island National Seashore staff.

The resource-specific context for the evaluation of impacts on historic structures is as follows:

- The seashore contains significant historic structures that are important resources to the seashore, although they are not fundamental to the seashore's purpose and significance.
- Two structures have been determined eligible for listing in the *National Register*:
  - The Assateague Beach U.S. Coast Guard Station is architecturally significant as a representative example of early 20th century U.S. Coast Guard Buildings constructed primarily to execute the boat and life rescue service along the Atlantic Coast. It is also a Virginia state landmark.
  - Green Run Lodge is significant as a representative example waterfowl hunting camps associated with historical commercial and recreational hunting on Assateague Island.

### 4.6.2 ALTERNATIVE 1 – CONTINUATION OF CURRENT MANAGEMENT

- **Impact Analysis**

**Coastal Response Management Actions.** At the Assateague Beach U.S. Coast Guard Station, NPS would take limited actions to protect or stabilize the ocean dunes or bay shoreline now or in the event of future storm damage to the dune or shoreline. The ocean side primary dune and the bayside shoreline are currently stable, for the time being protecting the land area where the station is located. Limited 7action would increase the potential for damage or loss of historic structures at the coast guard station by natural coastal processes and/or the effects of climate change/sea level rise.

At Green Run Lodge, the NPS would not take action to protect or stabilize the bay shoreline now or in the event of future storm damage to the shoreline. The bayside shoreline is currently stable, for the time being protecting the land area where the lodge is located. Lack of action would increase the potential for damage or loss of historic structures at Green Run Lodge by natural coastal processes and/or the effects of climate change/sea level rise.

If damage occurs to either historic property, the NPS would conduct a value analysis to determine whether or not repairs would be made, taking into consideration the historic significance of the structures and cultural landscape, the level of damage, and the likelihood of further damage from natural coastal processes and the effects of climate change/sea level rise. NPS would also follow NPS guidelines for the treatment of historic structures likely to be affected by climate change. If it is determined that historic structures could no longer be maintained due to recurring damage, the NPS would likely demolish the structure and rehabilitate the site to foster a return to natural conditions. Prior to demolition, resources would be documented in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (NPS 1995c) and other NPS policies, guidelines, and standards.

**Natural Resource Management Actions.** Analysis of natural resource management actions identified no associated impacts on historic structures.

**Cultural Resource Management Actions.** At the Assateague Beach U.S. Coast Guard Station, the NPS would maintain current management practices. All structures would be maintained, as they are considered part of one historic complex or system, although priority would continue to be placed on maintaining the station house and boathouse. The seashore would continue basic resource maintenance and stabilization of structures. Current management practices include stabilizing the structures and conducting repair or rehabilitation projects as funds become available. Maintenance could include painting, roof and foundation stabilization, and waterproofing. Current planned and programmed management actions include replacement of primary electrical service to the station and repairs to the boat dock to retain historic character.

Collectively these actions would result in a short-term beneficial impact on the character-defining features of historic structures at the coast guard station (by maintaining power supply and repairing the boat dock).

At Green Run Lodge, NPS would maintain current management practices. The lodge would remain vacant. The seashore would continue basic resource maintenance and stabilization of the structure. Planned and programmed management actions include shell stabilization and waterproofing. Availability of funding for additional repairs would continue to be inconsistent and scarce, as other seashore resources that are used regularly receive funding priority. Collectively these actions would continue to protect minimally the character-defining features of Green Run Lodge, resulting in a short-term beneficial impact on historic structures.

**Visitor Use and Visitor Experience Management Actions.** Analysis of visitor use and visitor experience management actions identified no associated impacts on historic structures.

**Seashore Operations Management Actions.** Analysis of seashore operations management actions identified no associated impacts on historic structures.

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have impacts on historic structures generally include growth and development on private property on the mainland adjoining the seashore, as well as public development and transportation system improvements on the mainland. With the exception of the town of Berlin, there are no local regulations in place to protect historic structures on private land during the land development process in Worcester County (MD), Accomack County (VA), or incorporated municipalities within the counties. As a result, historic structures have been lost and will continue to be lost or impacted by private development actions that adversely impact their character-defining features. Conversely, public development and transportation system projects with federal funding are required to engage in a consultation process to identify ways to minimize potential adverse effects to historic structures in accordance with section 106 of the National Historic Preservation Act of 1966, as amended (NHPA).

The overall cumulative impacts would be primarily adverse because historic structures on the mainland would continue to be adversely impacted by development projects. Alternative 1 would add an imperceptible increment to the overall adverse cumulative impact because of impacts to the seashore's historic structures over the long-term from coastal processes and the effects of climate change/sea level rise. There would also be beneficial cumulative impacts associated with actions taken to minimize or avoid impacts to historic structures associated with land development projects on the mainland. Alternative 1 would add an imperceptible increment to the beneficial impact

due to continued efforts to maintain the seashore's historic structures until they may be lost or irrevocably damaged.

- **Conclusions**

In alternative 1 management actions would both adverse and beneficial impacts on historic structures, and would add an imperceptible adverse increment and an imperceptible beneficial increment to the total cumulative impacts on historic structures, respectively.

Limited management actions to stabilize and further protect the primary ocean dune and the bay shoreline would continue to expose the station structures and lodge to significant damage and/or potential loss of the land mass upon which they are located. Ultimately, the historic structures would likely be significantly damaged and/or lost, resulting in long-term adverse impacts on historic structures. The potential adverse impacts would be significant because the resources, which are eligible for listing on the *National Register*, would be lost.

The beneficial impacts would result from continuing to maintain the character-defining features of the Assateague Beach U.S. Coast Guard Station and Green Run Lodge.

### 4.6.3 IMPACTS COMMON TO ALL ACTION ALTERNATIVES

In alternatives 2, 3, and 4, the NPS would initially maintain current management practices and uses for historic structures at the coast guard station as in alternative 1. Collectively these actions would result in a short-term beneficial impact on the character-defining features of historic structures at the coast guard station by maintaining power supply and repairing the boat dock.

### 4.6.4 ALTERNATIVE 2 – CONCENTRATED TRADTIONAL BEACH RECREATION

- **Impact Analysis**

**Coastal Response Management Actions.** At the Assateague Beach U.S. Coast Guard Station and at Green Run Lodge, the NPS would no longer protect and stabilize the dunes and shoreline to more effectively withstand future storm damage. This would increase the potential for damage or loss by natural coastal processes and/or the effects of climate change/sea level rise.

If it is determined that the historic structures and cultural landscape have become so damaged by coastal storms, sea level rise, or other climate change related issues that they create a hazard, NPS would likely demolish the structures and rehabilitate the sites to foster a return to natural conditions. Prior to demolition, resources would be documented in accordance with the *Secretary of the Interior's Standards for the*

*Treatment of Historic Properties* (NPS 1995c) and other NPS policies, guidelines, and standards.

**Natural Resource Management Actions.** Analysis of natural resource management actions identified no associated impacts on historic structures.

**Cultural Resource Management Actions.** Both Assateague Beach U.S. Coast Guard Station and the former Green Run Lodge sites are vulnerable to sea level rise, and understanding this, NPS would not take any further actions to stabilize or maintain historic structures at these sites. Over time, lack of maintenance would result in the gradual loss of the character-defining features of the historic structures, resulting in a likely long-term adverse impact on historic structures.

**Visitor Use and Visitor Experience Management Actions.** Analysis of visitor use and visitor experience management actions identified no associated impacts on historic structures.

**Seashore Operations Management Actions.** Analysis of seashore operations management actions identified no associated impacts on historic structures.

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have impacts on historic structures would be the same as those identified for alternative 1 (section 4.6.2).

The overall cumulative impacts would be primarily adverse because historic structures on the mainland would continue to be adversely impacted by development projects. Alternative 2 would add an imperceptible increment to the overall adverse cumulative impact because of impacts to the seashore's historic structures over the long-term from lack of maintenance and from coastal processes and the effects of climate change/sea level rise. There would also be beneficial cumulative impacts associated with actions taken to minimize or avoid impacts to historic structures associated with land development projects on the mainland. Alternative 2 would add an imperceptible increment to the adverse impact due to lack of continued efforts to maintain the seashore's few historic structures until they may be lost or irrevocably damaged.

- **Conclusions**

In alternative 2 management actions would have an adverse impact on historic structures and would add an imperceptible increment to the total cumulative adverse impacts on historic structures.

At the former Assateague Beach U.S. Coast Guard Station and the former Green Run Lodge, lack of maintenance and management actions to stabilize and further protect the

bay shoreline would continue to expose the historic structures to significant damage and/or potential loss of the land mass upon which they are located. Ultimately, the historic structures would likely be significantly damaged and/or lost, resulting in long-term adverse impacts on historic structures. The potential adverse impact would be significant because the former Assateague Beach U.S. Coast Guard Station and the former Green Run Lodge, which are eligible for listing on the *National* Register, would be lost.

### 4.6.5 ALTERNATIVE 3 – SUSTAINABLE RECREATION AND CLIMATE CHANGE ADAPTATION (NPS PREFERRED ALTERNATIVE)

**Coastal Response Management Actions.** At the Assateague Beach U.S. Coast Guard Station, the NPS would protect and stabilize the dunes and shoreline to withstand future storm damage more effectively. As investments are made in rehabilitating the station structures, there would be additional incentives and financial resources available from a partner organization for further protecting and stabilizing the dunes and shoreline to withstand potential impacts of natural coastal processes and the effects of climate change/sea level rise.

At Green Run Lodge, the NPS would protect and stabilize the bay shoreline to withstand future storm damage more effectively. These actions would decrease the potential for damage or loss of historic structures at Green Run Lodge. There would be potential for a future beneficial impact on the lodge by protecting it from natural coastal processes and/or the effects of climate change/sea level rise that would have otherwise damaged or destroyed the structure. However, it is likely that over time the protection and stabilization measures would be unable to provide adequate protection.

As in alternatives 1 and 4, if damage occurs to either historic property, the NPS would conduct a value analysis to determine whether or not repairs would be made, taking into consideration the historic significance of the structures and cultural landscape, the level of damage, and the likelihood of further damage from natural coastal processes and the effects of climate change/sea level rise. NPS would also follow agency and departmental guidelines for the treatment of historic structures likely to be affected by climate change. If it is determined that historic structures could no longer be maintained due to recurring damage, the NPS would likely demolish the structure and rehabilitate the site to foster a return to natural conditions. Prior to demolition, resources would be documented in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (NPS 1995c) and other NPS policies, guidelines, and standards.

**Natural Resource Management Actions.** Analysis of natural resource management actions identified no associated impacts on historic structures.

**Cultural Resource Management Actions.** At the Assateague Beach U.S. Coast Guard Station, the NPS would seek partners to adaptively reuse the coast guard station as a site for environmental research and/or education. Once a partnership is in place, the NPS would collaborate to develop and implement a suitable plan for rehabilitating the structures for adaptive reuse. Rehabilitation would be in conformance with the *Secretary of the Interior's Standards for Historic Preservation*. Additional funding would likely be available on a consistent basis from the partner organization to enhance long-term maintenance and stabilization of structures. Occupancy and ongoing use of the structures would generally enhance maintenance and care of structures, helping to preserve them. Collectively these actions would result in a beneficial impact on historic structures.

At Green Run Lodge, the NPS would rehabilitate and adaptively reuse the historic structure. Rehabilitation would be in conformance with the *Secretary of the Interior's Standards for Historic Preservation*. Occupancy and ongoing use of the structures would generally enhance maintenance and care of structures, helping to preserve them. Collectively these actions would result in a beneficial impact on historic structures.

**Visitor Use and Visitor Experience Management Actions.** Analysis of visitor use and visitor experience management actions identified no associated impacts on historic structures.

**Seashore Operations Management Actions.** Analysis of seashore operations management actions identified no associated impacts on historic structures.

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have impacts on historic structures would be the same as those identified for alternative 1 (section 4.6.2).

The overall cumulative impacts would be primarily adverse because historic structures on the mainland would continue to be adversely impacted by development projects. Alternative 3 would add an imperceptible increment to the overall adverse cumulative impact because of impacts to the seashore's historic structures over the long-term from coastal processes and the effects of climate change/sea level rise. There would also be beneficial cumulative impacts associated with actions taken to minimize or avoid impacts to historic structures associated with land development projects on the mainland. Alternative 3 would add an imperceptible increment to the beneficial impact due to continued efforts to maintain the seashore's historic structures until they may be lost or irrevocably damaged.

- **Conclusions**

In alternative 3 management actions would have both adverse and beneficial impacts on historic structures and would add an imperceptible adverse increment and an imperceptible beneficial increment to the total cumulative impacts on historic structures, respectively.

Additional protective actions at both the Assateague Beach U.S. Coast Guard Station and Green Run Lodge would reduce exposure to significant damage and/or potential loss from the impacts of natural coastal processes and/or climate change/sea level rise. While these actions might prolong the ability to maintain the structures, resulting in a short-term beneficial impact on historic structures, over time these actions would likely prove inadequate. Ultimately, historic structures would likely be significantly damaged and/or lost, resulting in long-term adverse impacts on historic structures. The potential adverse impacts would be significant because historic structures, which are eligible for listing on the *National* Register, would be lost.

As in alternative 1, the beneficial impacts would result from continuing to maintain the character-defining features of the Assateague Beach U.S. Coast Guard Station and Green Run Lodge. In addition, in alternative 3, both the Assateague Beach U.S. Coast Guard Station and Green Run Lodge would be rehabilitated in accordance with the Secretary's Standards for Historic Preservation and adaptively reused. There would be a beneficial impact on historic structures due to enhanced maintenance and compatible reuse and occupancy of the structures.

### 4.6.6 ALTERNATIVE 4 – NATURAL ISLAND EVOLUTION AND A PRIMITIVE ISLAND EXPERIENCE

- **Impact Analysis**

**Coastal Response Management Actions.** At the Assateague Beach U.S. Coast Guard Station, the NPS would implement only limited actions to protect and stabilize the dunes and shoreline to withstand future storm damage more effectively.

At Green Run Lodge, the NPS would protect and stabilize the bay shoreline to withstand future storm damage more effectively. These actions would decrease the potential for damage or loss of historic structures at Green Run Lodge. There would be potential for a future beneficial impact on the lodge by protecting it from natural coastal processes and/or the effects of climate change/sea level rise that would have otherwise damaged or destroyed the structure. However, it is likely that over time the protection and stabilization measures would be unable to provide adequate protection.

As in alternatives 1 and 3, If damage occurs to either historic property, the NPS would conduct a value analysis to determine whether or not repairs would be made, taking into consideration the historic significance of the structures and cultural landscape, the

level of damage, and the likelihood of further damage from natural coastal processes and the effects of climate change/sea level rise. NPS would also follow agency and departmental guidelines for the treatment of historic structures likely to be affected by climate change. If it is determined that historic structures could no longer be maintained due to recurring damage, the NPS would likely demolish the structure and rehabilitate the site to foster a return to natural conditions. Prior to demolition, resources would be documented in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (NPS 1995c) and other NPS policies, guidelines, and standards.

**Natural Resource Management Actions.** Analysis of natural resource management actions identified no associated impacts on historic structures.

**Cultural Resource Management Actions.** At the Assateague Beach U.S. Coast Guard Station, the NPS would maintain current management practices, as in alternative 1. Collectively these actions would result in a short-term beneficial impact on the character-defining features of historic structures at the coast guard station (by maintaining power supply and repairing the boat dock).

As in alternative 3, at Green Run Lodge, the NPS would rehabilitate and adaptively reuse the historic structure. Rehabilitation would be in conformance with the *Secretary of the Interior's Standards for Historic Preservation*. Occupancy and ongoing use of the structures would generally enhance maintenance and care of structures, helping to preserve them. Collectively these actions would result in a beneficial impact on historic structures.

**Visitor Use and Visitor Experience Management Actions.** Analysis of visitor use and visitor experience management actions identified no associated impacts on historic structures.

**Seashore Operations Management Actions.** Analysis of seashore operations management actions identified no associated impacts on historic structures.

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have impacts on historic structures would be the same as those identified for alternative 1 (section 4.6.2).

The overall cumulative impacts would be primarily adverse because historic structures on the mainland would continue to be adversely impacted by development projects. Alternative 4 would add an imperceptible increment to the overall adverse cumulative impact because of impacts to the seashore's historic structures over the long-term from coastal processes and the effects of climate change/sea level rise. There would also be

beneficial cumulative impacts associated with actions taken to minimize or avoid impacts to historic structures associated with land development projects on the mainland. Alternative 4 would add an imperceptible increment to the beneficial impact due to continued efforts to maintain the seashore's historic structures until they may be lost or irrevocably damaged.

- **Conclusions**

In alternative 4 management actions would have both adverse and beneficial impacts on historic structures and would add an imperceptible adverse increment and an imperceptible beneficial increment to the total cumulative impacts on historic structures, respectively.

Limited additional protective actions at the Assateague Beach U.S. Coast Guard Station would slightly reduce exposure to significant damage and/or potential loss from the impacts of natural coastal processes and/or climate change/sea level rise. At Green Run Lodge, more aggressive protective actions would provide additional defense. While these actions might prolong the ability to maintain the structures, resulting in a short-term beneficial impact on historic structures, over time these actions would likely prove inadequate. Ultimately, historic structures would likely be significantly damaged and/or lost, resulting in long-term adverse impacts on historic structures. The potential adverse impacts would be significant because historic structures, which are eligible for listing on the *National* Register, would be lost.

As in alternative 1, the beneficial impacts would result from continuing to maintain the character-defining features of the Assateague Beach U.S. Coast Guard Station and Green Run Lodge. In addition, in alternative 4, Green Run Lodge would be rehabilitated in accordance with the *Secretary's Standards for Historic Preservation* and adaptively reused. There would be a beneficial impact on historic structures due to enhanced maintenance and compatible reuse and occupancy of the structures.

## 4.7 Cultural Landscapes

### 4.7.1 METHODOLOGY FOR ANALYZING IMPACTS

Impacts on cultural landscapes are described in terms consistent with the Council on Environmental Quality (CEQ) for implementing the National Environmental Policy Act (NEPA) as described above for historic structures (see section 4.6.1).

The resource-specific context for the evaluation of impacts on cultural landscapes is as follows:

- Assateague Island represents a cultural landscape that has been shaped by both human intervention and the forces of nature. In particular, the cultural

landscape associated with the Assateague Beach U.S. Coast Guard Station complex is an important resource to the seashore, although it is not fundamental to the seashore's purpose and significance.

- The cultural landscape at the Assateague Beach U.S. Coast Guard Station is significant (determined eligible for listing in the *National* Register) as an individual landscape within the seashore that contains systems and features that contribute significantly to the unique qualities of the coast guard station complex. Views to and from the property add to the story of the U.S. Coast Guard's history by providing a visual of how life may have been for the life-savers of the surf on an isolated barrier island along the Atlantic coast (NPS 2004).

### 4.7.2 ALTERNATIVE 1 – CONTINUATION OF CURRENT MANAGEMENT

- **Impact Analysis**

**Coastal Response Management Actions.** At the Assateague Beach U.S. Coast Guard Station, the ocean side primary dune and the bayside shoreline are currently stable, for the time being protecting the land area where the station is located. The NPS would not take action to protect or stabilize the ocean dunes or bay shoreline now or in the event of future storm damage to the dune or shoreline. Lack of action would increase the potential for damage or loss of the cultural landscape by natural coastal processes and/or the effects of climate change/sea level rise. Some character-defining features of the cultural landscape such as circulation patterns would continue to deteriorate and eventually be lost.

If damage occurs to the station and its cultural landscape, the NPS would conduct a value analysis to determine whether or not repairs would be made, taking into consideration the historic significance of the structures and cultural landscape, the level of damage, and the likelihood of further damage from natural coastal processes and the effects of climate change/sea level rise. NPS would also follow agency and departmental guidelines for the treatment of historic structures likely to be affected by climate change. If it is determined that the station could no longer be maintained due to recurring damage, the NPS would likely demolish the station and rehabilitate the site to foster a return to natural conditions. Prior to demolition, resources would be documented in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (NPS 1995c) and other NPS policies, guidelines, and standards.

**Natural Resource Management Actions.** Analysis of natural resource management actions identified no associated impacts on the cultural landscape at the Assateague Beach U.S. Coast Guard Station.

**Cultural Resource Management Actions.** At the Assateague Beach U.S. Coast Guard Station, the NPS would continue current management practices to maintain the cultural landscape and keep it eligible for the *National Register*. The NPS would continue to maintain circulation patterns and other character-defining features of the cultural landscape. Landscape features such as views and vistas would not be altered. Current planned and programmed management actions include replacement of primary electrical service to the station and repairs to the boat dock to retain historic character. Availability of funding for additional repairs would continue to be inconsistent and scarce, as other seashore resources that are used more regularly receive funding priority. Collectively these actions would result in a short-term beneficial impact on the character-defining features of the cultural landscape at the coast guard station by maintaining power supply and repairing the boat dock.

**Visitor Use and Visitor Experience Management Actions.** Analysis of visitor use and visitor experience management actions identified no associated impacts on the cultural landscape at the Assateague Beach U.S. Coast Guard Station.

**Seashore Operations Management Actions.** Analysis of seashore operations management actions identified no associated impacts on the cultural landscape at the Assateague Beach U.S. Coast Guard Station.

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have impacts on cultural landscapes generally include growth and development on private property on the mainland adjoining the seashore, as well as public development and transportation system improvements on the mainland. There are no local regulations in place to protect cultural landscapes on private land during the land development process in Worcester County (MD), Accomack County (VA), or incorporated municipalities within the counties. As a result, significant cultural landscapes have been lost and will continue to be lost or impacted by private development actions that adversely impact their character-defining features. Conversely, public development and transportation system projects with federal funding are required to engage in a consultation process to identify ways to avoid or minimize potential adverse impacts to cultural landscapes in accordance with section 106 of the National Historic Preservation Act of 1966, as amended (NHPA).

The overall cumulative impacts would be primarily adverse because cultural landscapes on the mainland would continue to be adversely impacted by development projects. Alternative 1 would add an imperceptible increment to the overall adverse cumulative impact because of impacts to the seashore's cultural landscapes over the long-term from coastal processes and the effects of climate change/sea level rise. There would also be beneficial cumulative impacts associated with actions taken to minimize or avoid impacts to cultural landscapes associated with land development projects on the

mainland. Alternative 1 would add an imperceptible increment to the beneficial impact due to continued efforts to maintain the seashore's cultural landscapes until they may be lost or irrevocably damaged.

- **Conclusions**

In alternative 1 management actions would have both adverse and beneficial impacts on cultural landscapes and would add an imperceptible adverse increment and an imperceptible beneficial increment to the total cumulative impacts on cultural landscapes, respectively.

Lack of management actions to stabilize and further protect the primary ocean dune and the bay shoreline would continue to expose the coast guard station's cultural landscape to significant damage and/or potential loss of the land mass upon which it is located. Ultimately, the cultural landscape would likely be significantly damaged and/or lost, resulting in adverse impacts on the cultural landscape. The potential adverse impact would be significant because the resource, which is eligible for listing on the *National* Register, would be lost.

The beneficial impact would result from continuing to maintain the character-defining features of the cultural landscape at the Assateague Beach U.S. Coast Guard Station.

### 4.7.3 IMPACTS COMMON TO ALL ACTION ALTERNATIVES

In alternatives 2, 3, and 4, the NPS would initially continue to maintain the Assateague Beach U.S. Coast Guard Station cultural landscape to keep it eligible for the *National Register* as in alternative 1. Collectively these actions would result in a beneficial impact on the character-defining features of the coast guard station's cultural landscape.

### 4.7.4 ALTERNATIVE 2 – CONCENTRATED TRADTIONAL BEACH RECREATION

- **Impact Analysis**

**Coastal Response Management Actions.** At the Assateague Beach U.S. Coast Guard Station the NPS would no longer protect and stabilize the dunes and shoreline to withstand more effectively future storm damage. This would increase the potential for damage or loss by natural coastal processes and/or the effects of climate change/sea level rise resulting in a likely adverse impact on the station's cultural landscape.

If it is determined that the historic structures and cultural landscape have become so damaged by coastal storms, sea level rise, or other climate change related issues that they create a hazard, NPS would likely demolish the structures and rehabilitate the sites to foster a return to natural conditions. Prior to demolition, resources would be documented in accordance with the *Secretary of the Interior's Standards for the*

*Treatment of Historic Properties* (NPS 1995c) and other NPS policies, guidelines, and standards.

**Natural Resource Management Actions.** Analysis of natural resource management actions identified no associated impacts on the cultural landscape at the Assateague Beach U.S. Coast Guard Station.

**Cultural Resource Management Actions.** NPS would not take any further actions to stabilize or maintain the cultural landscape at the Assateague Beach U.S. Coast Guard Station. Over time, lack of maintenance would result in the loss of character-defining features of the cultural landscape, resulting in a likely long-term adverse impact on cultural landscapes.

**Visitor Use and Visitor Experience Management Actions.** Analysis of visitor use and visitor experience management actions identified no associated impacts on the cultural landscape at the Assateague Beach U.S. Coast Guard Station.

**Seashore Operations Management Actions.** Analysis of seashore operations management actions identified no associated impacts on the cultural landscape at the Assateague Beach U.S. Coast Guard Station.

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have impacts on cultural landscapes would be the same as those identified for alternative 1 (section 4.7.2).

The overall cumulative impacts would be primarily adverse because cultural landscapes on the mainland would continue to be adversely impacted by development projects. Alternative 2 would add an imperceptible increment to the overall adverse cumulative impact because of impacts to the seashore's cultural landscapes over the long-term from coastal processes and the effects of climate change/sea level rise. There would also be beneficial cumulative impacts associated with actions taken to minimize or avoid impacts to cultural landscapes associated with land development projects on the mainland.

- **Conclusions**

In alternative 2 management actions would have adverse impacts on cultural landscapes and would add an imperceptible increment to the total cumulative adverse impacts on cultural landscapes.

At the former Assateague Beach U.S. Coast Guard Station, lack of maintenance and lack of management actions to stabilize and further protect the bay shoreline would continue to expose the cultural landscape to significant damage and/or potential loss of

the land mass upon which it is located. Ultimately, the cultural landscape would likely be significantly damaged and/or lost, resulting in a long-term adverse impact on cultural landscapes. The potential adverse impact would be significant because the former Assateague Beach U.S. Coast Guard Station cultural landscape, which is eligible for listing on the *National* Register, would be lost.

### 4.7.5 ALTERNATIVE 3 – SUSTAINABLE RECREATION AND CLIMATE CHANGE ADAPTATION (NPS PREFERRED ALTERNATIVE)

**Coastal Response Management Actions.** At the Assateague Beach U.S. Coast Guard Station, the NPS would protect and stabilize the dunes and shoreline to withstand future storm damage more effectively. As investments are made in rehabilitating the station structures for adaptive reuse, there would be additional incentives and financial resources available from the partner organization for further protecting and stabilizing the dunes and shoreline to withstand potential impacts of natural coastal processes and the effects of climate change/sea level rise. As a result, it would likely be possible to maintain the station structures in situ and their cultural landscape for a longer time, resulting in a short-term beneficial impact.

As in alternatives 1 and 4, if damage occurs to the station and its cultural landscape, the NPS would conduct a value analysis to determine whether or not repairs would be made, taking into consideration the historic significance of the structures and cultural landscape, the level of damage, and the likelihood of further damage from natural coastal processes and the effects of climate change/sea level rise. NPS would also follow NPS guidelines for the treatment of historic structures likely to be affected by climate change. If it is determined that the station could no longer be maintained due to recurring damage, the NPS would likely demolish the station and rehabilitate the site to foster a return to natural conditions. Prior to demolition, resources would be documented in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (NPS 1995c) and other NPS policies, guidelines, and standards.

**Natural Resource Management Actions.** Analysis of natural resource management actions identified no associated impacts on the cultural landscape at the Assateague Beach U.S. Coast Guard Station.

**Cultural Resource Management Actions.** At the Assateague Beach U.S. Coast Guard Station, the NPS would seek partners to adaptively reuse the coast guard station as a site for environmental research and/or education. Until a partnership exists, the NPS would continue to maintain the cultural landscape to keep it eligible for the *National Register* as in alternative 1. Once a partnership is in place, the NPS would collaborate to develop and implement a suitable plan for rehabilitating the structures and cultural landscape for adaptive reuse. Rehabilitation would be in conformance with the *Secretary of the Interior's Standards for Historic Preservation*. Additional funding would

likely be available on a consistent basis from the partner organization to enhance long-term maintenance and stabilization of structures. Occupancy and ongoing use of the structures and the surrounding landscape would generally enhance maintenance and care of structures and the landscape, helping to preserve them. Most or all of the contributing landscape features would be maintained or rehabilitated to reflect the station's period of significance. Collectively these actions would result in a short-term beneficial impact on the station's cultural landscape.

**Visitor Use and Visitor Experience Management Actions.** Analysis of visitor use and visitor experience management actions identified no associated impacts on the cultural landscape at the Assateague Beach U.S. Coast Guard Station.

**Seashore Operations Management Actions.** Analysis of seashore operations management actions identified no associated impacts on the cultural landscape at the Assateague Beach U.S. Coast Guard Station.

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have impacts on cultural landscapes would be the same as those identified for alternative 1 (section 4.7.2).

The overall cumulative impacts would be primarily adverse because cultural landscapes on the mainland would continue to be adversely impacted by development projects. Alternative 3 would add an imperceptible increment to the overall adverse cumulative impact because of impacts to the seashore's cultural landscapes over the long-term from coastal processes and the effects of climate change/sea level rise. There would also be beneficial cumulative impacts associated with actions taken to minimize or avoid impacts to cultural landscapes associated with land development projects on the mainland. Alternative 3 would add an imperceptible increment to the beneficial impact due to continued efforts to maintain the seashore's cultural landscapes until they may be lost or irrevocably damaged.

- **Conclusions**

In alternative 3 management actions would have both adverse and beneficial impacts on cultural landscapes and would add an imperceptible adverse increment and an imperceptible beneficial increment to the total cumulative impacts on cultural landscapes, respectively.

Additional protective actions would reduce exposure of the cultural landscape to significant damage and/or potential loss from the impacts of natural coastal processes and/or climate change/sea level rise. While these actions might prolong the ability to maintain the cultural landscape, resulting in a short-term beneficial impact on cultural

landscapes, over time these actions would likely prove inadequate. Ultimately, the cultural landscape would likely be significantly damaged and/or lost, resulting in a long-term adverse impact. The potential adverse impact would be significant because the cultural landscape – which is eligible for the *National Register* – would be lost.

As in alternative 1, the beneficial impact would result from continuing to maintain the character-defining features of the cultural landscape at the Assateague Beach U.S. Coast Guard Station. In addition, in alternative 3, the cultural landscape would be rehabilitated in accordance with the Secretary's Standards for Historic Preservation and adaptively reused. There would be a short-term beneficial impact on the cultural landscape due to enhanced maintenance and compatible reuse and occupancy of the site.

### 4.7.6 ALTERNATIVE 4 – NATURAL ISLAND EVOLUTION AND A PRIMITIVE ISLAND EXPERIENCE

- **Impact Analysis**

**Coastal Response Management Actions.** At the Assateague Beach U.S. Coast Guard Station, the NPS would not take action to protect or stabilize the ocean dunes or bay shoreline now or in the event of future storm damage to the dune or shoreline, as in alternative 1. Lack of action would increase the potential for damage or loss by natural coastal processes and/or the effects of climate change/sea level rise. Some character-defining features such as circulation patterns would continue to deteriorate and eventually be lost.

As in alternatives 1 and 3, if damage occurs to the station and its cultural landscape, the NPS would conduct a value analysis to determine whether or not repairs would be made, taking into consideration the historic significance of the structures and cultural landscape, the level of damage, and the likelihood of further damage from natural coastal processes and the effects of climate change/sea level rise. NPS would also follow NPS guidelines for the treatment of historic structures likely to be affected by climate change. If it is determined that the station could no longer be maintained due to recurring damage, the NPS would likely demolish the station and rehabilitate the site to foster a return to natural conditions. Prior to demolition, resources would be documented in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (NPS 1995c) and other NPS policies, guidelines, and standards.

**Natural Resource Management Actions.** Analysis of natural resource management actions identified no associated impacts on the cultural landscape at the Assateague Beach U.S. Coast Guard Station.

**Cultural Resource Management Actions.** At the Assateague Beach U.S. Coast Guard Station, the NPS would maintain current management practices, as in alternative 1. Collectively these actions would result in a short-term beneficial impact on the character-defining features of the cultural landscape at the coast guard station.

**Visitor Use and Visitor Experience Management Actions.** Analysis of visitor use and visitor experience management actions identified no associated impacts on the cultural landscape at the Assateague Beach U.S. Coast Guard Station.

**Seashore Operations Management Actions.** Analysis of seashore operations management actions identified no associated impacts on the cultural landscape at the Assateague Beach U.S. Coast Guard Station.

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have impacts on cultural landscapes would be the same as those identified for alternative 1 (section 4.7.2).

The overall cumulative impacts would be primarily adverse because cultural landscapes on the mainland would continue to be adversely impacted by development projects. Alternative 4 would add an imperceptible increment to the overall adverse cumulative impact because of impacts to the seashore's cultural landscapes over the long-term from coastal processes and the effects of climate change/sea level rise. There would also be beneficial cumulative impacts associated with actions taken to minimize or avoid impacts to cultural landscapes associated with land development projects on the mainland. Alternative 4 would add an imperceptible increment to the beneficial impact due to continued efforts to maintain the seashore's cultural landscapes until they may be lost or irrevocably damaged.

- **Conclusions**

In alternative 4 management actions would have both adverse and beneficial impacts on cultural landscapes and would add an imperceptible adverse increment and an imperceptible beneficial increment to the total cumulative impacts on cultural landscapes, respectively.

Limited additional protective actions at the Assateague Beach U.S. Coast Guard Station would slightly reduce exposure of the cultural landscape to significant damage and/or potential loss from the impacts of natural coastal processes and/or climate change/sea level rise. While these actions might prolong the ability to maintain the cultural landscape, resulting in a short-term beneficial impact on cultural landscapes, over time these actions would likely prove inadequate. Ultimately, the cultural landscape would likely be significantly damaged and/or lost, resulting in a long-term adverse impact. The

potential adverse impact would be significant because the cultural landscape – which is eligible for the *National Register* – would be lost.

As in alternative 1, the beneficial impact would result from continuing to maintain the character-defining features of the cultural landscape at the Assateague Beach U.S. Coast Guard Station.

## 4.8 Seashore Operations

### 4.8.1 METHODOLOGY

Analysis of impacts on seashore operations focuses on the need for effective organizational management of the seashore, specifically considering how well each alternative accomplishes the following:

- reduces existing risks of impacts to seashore operations from catastrophic storms and the effects of climate change/sea level rise
- increases the extent to which infrastructure is sustainable and effectively supports seashore operations
- supports staffing levels that are adequate to protect and preserve the seashore's resources and infrastructure and to maintain and enhance the visitor experiences
- promotes partnerships and volunteer programs that effectively support seashore operations

The resource-specific context for the evaluation of impacts on seashore operations is as follows:

- The seashore's enabling legislation explicitly states that one of the two purposes for the seashore is to provide high quality resource-compatible recreational opportunities for visitors.
- Opportunities for visitors to experience the seashore through a wide variety of active and passive recreational and educational opportunities are values that are fundamental to the seashore's purpose and significance.
- The seashore currently lacks a contingency plan for mitigating the impacts from catastrophic storms and the effects of climate change/sea level rise. This raises uncertainty as to the sustainability of seashore infrastructure as well as access for seashore operations that are dependent upon land access via bridges and roads that are highly susceptible to recurring storm damage.
- The state of Maryland owns the only bridge that provides land access to the seashore in Maryland and controls how public funds are spent for maintenance. NPS owns the bridges that provide land access to the seashore in Virginia; FHWA generally assists the NPS with bridge maintenance.

- The seashore must operate within the constraints of the unit-specific budget and number of staff positions allocated by congress and the NPS Director's Office.

### 4.8.2 ALTERNATIVE 1 – CONTINUATION OF CURRENT MANAGEMENT

- **Impact Analysis**

**Coastal Response Management Actions.** In alternative 1, the seashore would not develop a specific contingency plan for responding to catastrophic storms and the effects of climate change/sea level rise. Over the long-term lack of contingency planning would increase the risks of impacts on seashore operations from catastrophic storms and the effects of climate change/sea level rise.

The location and spatial relationship of facilities and infrastructure would generally remain unchanged. In general, facility management needs would become more challenging and complex over time as NPS seeks to maintain recreation opportunities despite the continued evolution of the seashore's land base, damage to its infrastructure, and consolidation of visitor use facilities in an increasingly smaller developed area. Without fortification of the developed area, facilities and infrastructure would continue to be threatened by catastrophic storms and the effects of climate change/sea level rise. This management approach would have an adverse impact on seashore operations because over the long-term visitor use facilities and infrastructure would likely be non-sustainable due to lack of funding and ultimately due to the shrinking island land area.

The seashore would be exposed to very high risk of becoming abruptly inaccessible by vehicle in the event that a catastrophic storm destroys the MD Route 611 Bridge or breaches the island in the northern portion of the developed area. When this happens, without a contingency plan in place vehicular access to the island would be lost for months to years until either the bridge could be replaced or a water-based alternative transportation system (passenger ferry) for visitor access and seashore operations could be implemented. During this period, access to the island for seashore operations would be limited to small watercraft using public launch sites on the mainland and soft landings on the island. Maintaining and using seashore vehicles and equipment needed for maintenance on the island would become very difficult. This would result in a long-term adverse impact on seashore operations.

**Natural Resource Management Actions.** NPS would continue existing operations to protect and manage the seashore's natural resources focusing on research, monitoring, mitigation, and protection. Management would continue to require staff time and management that exceeds the seashore's current capacity and could have a long-term adverse impact on seashore operations.

**Cultural Resource Management Actions.** NPS would continue existing operations to protect and manage the seashore's cultural resources focusing on research, monitoring, mitigation, and protection. Management would continue to require staff time and management that exceeds the seashore's current capacity and could have a long-term adverse impact on seashore operations.

**Visitor Use and Visitor Experience Management Actions.** NPS would continue existing operations related to visitor use, public safety, interpretation, and environmental education, with a focus on the island developed area in Maryland, the developed area in Virginia, the OSV use area, and backcountry visitor use areas. Management would continue to require staff time that exceeds the seashore's current capacity and could have a long-term adverse impact on seashore operations.

**Seashore Operations Management Actions.** In alternative 1 existing management practices related to day-to-day seashore operations would continue. Filling some of the vacancies that currently impede the seashore's ability to maintain visitor facilities and infrastructure, complete needed resource management and stewardship activities, and provide the full range of visitor services would have a beneficial effect on seashore operations. However, it would be highly uncertain that staffing levels in alternative 1 could support operational needs if catastrophic storms and the effects of climate change/sea level rise damage seashore infrastructure and access; in that event there would be an adverse impact on seashore operations.

Continued use of the existing headquarters complex with miscellaneous repairs would have a long-term adverse impact on seashore operations. The complex is undersized and obsolete and does not support efficient administrative and maintenance functions at the seashore.

Additional beds for seasonal employees would become available in Maryland and Virginia. This would completely address the seashore's housing deficit, enabling the seashore to hire staff more easily for the summer season, resulting in a long-term beneficial impact on seashore operations.

The seashore's partnerships and volunteer program would continue to have a beneficial impact on seashore operations by facilitating a broad range of functions needed to protect seashore resources and provide recreational opportunities for visitors. Existing partnerships and cooperative relationships that support ongoing management programs and activities would continue. By collaborating with MD DNR at Assateague State Park the NPS would continue to address shared operational issues related to road congestion, provision of visitor services, and chronic resource management issues such as shoreline protection and horse management within the Maryland developed area. The seashore would continue to benefit from its partnership with the USACE to address the chronic sand supply impacts to the north end of Assateague Island from the jetty-

stabilized Ocean City Inlet (north end Restoration Project). Emergency service providers would continue to assist the NPS with law enforcement and fire protection/emergency services/search and rescue/hazardous material response. The Assateague Island Alliance – the seashore's primary friends group – would continue to assist the NPS with a variety of operations. The Volunteers in Parks (VIP) program would continue to benefit the seashore by contributing approximately 20,000 hours of time annually, representing a savings of approximately 7 percent of the seashore's annual operating budget. Seashore operations within CNWR would continue in collaboration with the US FWS pursuant to the memorandum of agreement whereby the NPS would provide visitor services, interpretive services, visitor and resource protection, and facility management in the assigned area within the refuge.

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have impacts on NPS seashore operations generally include actions by the MD DNR and the FWS. Each agency has constructed administrative and maintenance facilities at the seashore and on the mainland to support their operations; each agency in the future will continue to invest in facilities to address new and changing operational needs, including new facilities as well as rehabilitation/expansion of existing facilities. These facilities vary with respect to their sustainability and their capacity to support each agency's mission given the potential impacts of catastrophic storms and the effects of climate change/sea level rise.

To date contingency planning by the NPS, MD DNR, and FWS has focused on replacing some visitor use facilities and infrastructure that has reached the end of its life cycle, or that have been damaged by storms, with temporary structures that can be moved off the island to safe locations on the mainland in advance of coastal storms. In the future contingency planning will likely include more aggressive measures to relocate some visitor use facilities to the mainland. FWS is considering implementation of a summertime alternative transportation system for access to CNWR that would reduce the need for infrastructure on the island and that would prepare for water-based operations should access be lost.

NPS, MD DNR, and the FWS each have relied in the past, and will continue to rely in the future, on a network of public, private, and non-profit partners, volunteers, and friends groups who support various aspects of their mission at the seashore.

The overall cumulative impacts on seashore operations would be primarily adverse because contingency planning would continue to focus on replacing some visitor use facilities and infrastructure that has reached the end of its life cycle, or that have been damaged by storms, with temporary structures that can be moved off the island to safe locations on the mainland in advance of coastal storms. An adverse impact would also result from the uncertainty of federal and state funding to support staffing needed to

manage public lands within the seashore's boundary. Alternative 1 would add an appreciable increment to the overall adverse cumulative impact because lands managed by the NPS would continue to lack a comprehensive planning framework that addresses the full range of issues affecting seashore operations, particularly the potential adverse impacts of coastal processes and climate change/sea level rise. There would also be beneficial cumulative impacts associated with continuation of partnerships and volunteer programs that facilitate resource protection and enhance the visitor experience throughout the seashore. Alternative 1 would add an imperceptible increment to the beneficial impact due to continuation of existing seashore partnerships.

- **Conclusions**

In alternative 1 management actions would have both adverse and beneficial impacts on seashore operations and would add an appreciable adverse increment and an imperceptible beneficial increment to the total cumulative impacts on seashore operations, respectively.

The seashore would continue to operate without a contingency plan for responding to catastrophic storms and the effects of climate change/sea level rise; lack of a contingency plan would ultimately not mitigate the eventual impacts due to catastrophic storms and climate change/sea level rise resulting in an adverse impact on seashore operations. Visitor use facilities and infrastructure would remain in non-sustainable locations subject to recurring damage and eventual loss as the island's land area continues to shrink. The adverse impacts of alternative 1 on seashore operations would be significant. The seashore would be exposed to very high risk and uncertainty of becoming abruptly inaccessible by vehicle in the event of a catastrophic storm. Without vehicular access, the seashore would be unable to operate as needed to accomplish its purpose of providing high quality resource-compatible recreation opportunities and preserving coastal resources for months to years.

In alternative 1, staffing would be adequate under current conditions within existing budgetary constraints to maintain visitor use facilities and infrastructure, complete needed resource management and stewardship activities, and provide the full range of visitor services, resulting in a beneficial impact on seashore operations. Partnerships and volunteer programs would facilitate a broad range of functions needed to protect seashore resources and provide recreational opportunities for visitors, also resulting in a beneficial impact on seashore operations. The beneficial impacts on seashore operations would not be significant because there would be uncertainty as to whether staffing levels in alternative 1 could support operational needs if catastrophic storms and the effects of climate change/sea level rise damage seashore infrastructure and access.

### 4.8.3 IMPACTS COMMON TO ALL ACTION ALTERNATIVES

- **Impact Analysis**

**Natural Resource Management Actions.** Resource management and protection staff time would work with Virginia to assess privately owned structures located within the seashore's Virginia waters, eliminate illegal structures, and ensure appropriate wastewater management at legal structures. Resource management and protection staff time would also work with the states to address concerns regarding management of marine resources. These actions would require staff time and management that further exceeds the seashore's current capacity and could have a long-term adverse impact on seashore operations.

**Visitor Use and Visitor Experience Management Actions.** NPS would increase visitor services within the Maryland island developed area. This would require addition of a few small structures with parking to support commercial services provided by partners. Maintenance of these structures would require staff time and management that further exceeds the seashore's current capacity and could have a long-term adverse impact on seashore operations.

The former visitor center would be rehabilitated as a stand-alone environmental education center without expansion or change in the type or size of the facility. This would not appreciably add to the management responsibilities of seashore staff.

**Seashore Operations Management Actions.** In alternatives 2, 3, and 4 NPS and MD DNR would expand their existing partnership to address chronic congestion issues at the seashore during summer months. Together they would relocate the island entrance station to the mainland and cooperatively manage the facility. This would improve the flow of traffic onto the island during the summer months, make it easier to close the seashore to additional traffic once parking lots are full, facilitate implementation of the new NPS alternative transportation system, and protect seashore resources from damage due to illegal parking. This would result in a beneficial impact on seashore operations by reducing staff time needed for visitor use management, law enforcement, and resource protection.

Implementation of a concession-operated alternative transportation system (ATS) and relocation of the entrance station to the mainland would address existing vehicular congestion on the island and generally enhance the sustainability of the seashore's transportation infrastructure. Implementation would require a shift in seashore operations from congestion management on the island to management of mainland parking, visitor orientation, and management of visitor pedestrian circulation within the shuttle staging area. Management of the entrance station would be less complicated due to adequate space for queuing vehicles and shared responsibilities with MD DNR. Some additional administrative functions would be required to oversee the shuttle

concession. Overall staffing needs associated with the seashore entrance station would be reduced, resulting in a beneficial impact on seashore operations.

### 4.8.4 ALTERNATIVE 2 – CONCENTRATED TRADITIONAL BEACH RECREATION

- **Impact Analysis**

**Coastal Response Management Actions.** In alternative 2 the NPS would take steps to prepare for catastrophic storms and the effects of climate change/sea level rise by fortifying the Maryland developed area and letting the remainder of the island evolve naturally, driven by the full effects of natural coastal processes and climate change/sea level rise. The NPS would maintain existing visitor use facilities and infrastructure as long as feasible (e.g. land base exists and maintenance funding is available).

Overall, this approach to contingency planning would have an adverse impact on seashore operations. Over the long-term visitor use facilities and infrastructure could be sustained only by expensive engineering solutions that protect against catastrophic storms and the effects of climate change/sea level rise made possible by ongoing congressional funding appropriated for construction and emergency repairs. Risks of impacts to seashore operations from catastrophic storms and the effects of climate change/sea level rise would not be reduced. In the future, it would be likely that recreational uses could no longer be maintained within the developed area.

The seashore would be exposed to very high risk of becoming abruptly inaccessible by vehicle in the event that a catastrophic storm destroys the MD Route 611 Bridge or breaches the island in the northern portion of the developed area. When this happens, without a contingency plan in place access to the island would be lost for months to years until either the bridge could be replaced or a water-based alternative transportation system(passenger ferry) for visitor access and seashore operations could be implemented. During this period, access to the island for seashore operations would be limited to small watercraft using public launch sites on the mainland and soft landings on the island. Maintaining and using seashore vehicles and equipment needed for maintenance on the island would become very difficult. This would result in a long-term adverse impact on seashore operations.

**Natural Resource Management Actions.** In the event of a breach or other events that limit automobile access, the complexity of resource protection/management functions would significantly increase due to the logistical difficulties of water-based access. The reduction in the size of the OSV route would limit traditional access for public deer hunting, and could impact the ability to meet deer management objectives; in this event seashore managers would explore options and take actions to manage herd sizes, as appropriate. Collectively these additional management actions would require staff time and management that further exceeds the seashore's current capacity and could have a long-term adverse impact on seashore operations.

**Cultural Resource Management Actions.** Cultural resource management actions would require less resource management and maintenance capacity at the Assateague Beach U.S. Coast Guard Station. Less staff time would be needed resulting in a beneficial impact on seashore operations.

**Visitor Use and Visitor Experience Management Actions.** More intense focus on recreation in the Maryland developed area would likely require additional visitor use management capacity, such as expanded lifeguard and visitor and resource protection service. Reducing the OSV use area could increase visitor use management needs by concentrating the same number of OSV users within a smaller area. Collectively these additional visitor use management actions would require staff time and management that further exceeds the seashore's current capacity and could have a long-term adverse impact on seashore operations.

**Seashore Operations Management Actions.** In alternative 2 existing management practices related to day-to-day seashore operations would increase as visitor use and recreational infrastructure are consolidated within a smaller developed area where additional visitor facilities and services requiring staffing and maintenance would be added. The extent of facility management needs would also increase as natural coastal processes and the effects of climate change/sea level rise impact the island developed area, making protection increasingly complex and challenging. Estimates of long-term staffing requirements for alternative 2 indicate a need for an additional 4.5 FTE staff (compared to 2012 staff levels). If funding is available to support the additional 4.5 FTE, there would be a beneficial impact on seashore operations because all positions would be filled that are needed maintain public use facilities and infrastructure, complete needed resource management and stewardship activities, and provide the full range of visitor services. If additional funding were not available, there would be an adverse impact on seashore operations due to continuation of approximately six vacant positions at the seashore.

Replacement of the existing undersized and obsolete seashore headquarters complex at its current location would benefit seashore operations by facilitating more efficient and safe administrative and maintenance functions at the seashore.

Existing partnerships and cooperative relationships that support seashore management would continue. In order to fortify the Maryland developed area the NPS would seek to expand its existing partnership with the U.S. USACE. NPS would also seek to expand visitor services offered by tourism and recreation interests within the developed area. Successful partnerships in these areas would protect the NPS investment in visitor use facilities and infrastructure and enhance the recreational opportunities for visitors. This would reduce staff time needed for maintenance of facilities and infrastructure and for providing visitor services, resulting in a beneficial impact on seashore operations. However, over time the NPS management action in partnership with the USACE would

likely have a long-term adverse impact on seashore operations. Ultimately, this partnership would not support reduced risks of impacts to seashore operations from catastrophic storms and the effects of climate change/sea level rise for the reasons noted under contingency planning for alternative 2.

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have impacts on seashore operations would be the same as those identified for alternative 1 (section 4.8.2).

The overall cumulative impacts on seashore operations would be primarily adverse because contingency planning would continue to focus on fortification in combination with replacing some visitor use facilities and infrastructure that has reached the end of its life cycle, or that have been damaged by storms, with temporary structures that can be moved off the island to safe locations on the mainland in advance of coastal storms. An adverse impact would also result from the uncertainty of federal and state funding to support staffing needed to manage public lands within the seashore's boundary. Alternative 2 would add an appreciable increment to the overall adverse cumulative impact because NPS would manage its lands within the seashore's boundary with a contingency plan that would ultimately not mitigate the eventual impacts from catastrophic storms and climate change/sea level rise, and because of uncertainty of ONPS funding to support NPS staffing needed to accomplish the seashore's purposes. There would also be beneficial cumulative impacts associated with continuation of partnerships and volunteer programs that facilitate resource protection and enhance the visitor experience throughout the seashore. Alternative 2 would add a noticeable increment to the beneficial impact due to enhanced partnerships, particularly with the USACE.

- **Conclusions**

In alternative 2 management actions would have both adverse and beneficial impacts on seashore operations and would add an appreciable adverse increment and a noticeable beneficial increment to the total cumulative impacts on seashore operations, respectively.

The seashore would operate with a contingency plan that would ultimately not mitigate the eventual impacts from catastrophic storms and climate change/sea level rise, resulting in an adverse impact on seashore operations. Only through ongoing congressional funding appropriated for construction and emergency repairs could the seashore continue to maintain visitor use facilities and infrastructure and protect them from catastrophic storms and the effects of climate change/sea level rise resulting in an adverse impact on seashore operations. Only if increased ONPS funding becomes available for approximately six additional FTEs would staffing be adequate to maintain

visitor use facilities and infrastructure, to complete needed resource management and stewardship activities, and to provide the full range of visitor services, resulting in an adverse impact on seashore operations. Overall, the adverse impact of alternative 2 on seashore operations would be significant. Despite the contingency plan, the seashore would be exposed to very high risk and uncertainty of becoming abruptly inaccessible by vehicle in the event of a catastrophic storm. Without vehicular access, the seashore would be unable to operate as needed to accomplish its purpose of providing high quality resource-compatible recreation opportunities and preserving coastal resources for months to years. The uncertainty of ONPS funding to support the six FTEs required for seashore operations would jeopardize NPS's ability to accomplish the seashore's purposes.

As in alternative 1 partnerships and volunteer programs would facilitate a broad range of functions needed to protect seashore resources and provide recreational opportunities for visitors, resulting in a beneficial impact on seashore operations. An expanded partnership with the USACE would protect NPS investments in visitor use facilities and infrastructure within the Maryland developed area, reducing the potential for damage or loss and consequent impacts on seashore operations, resulting in a beneficial impact on seashore operations. The beneficial impacts on seashore operations would be significant because they would enhance the seashore's ability to accomplish its purpose of providing high quality resource-compatible recreation opportunities. However, the significant beneficial impact would exist only for as long as there is adequate land area to maintain recreational use within the developed area. Once catastrophic storms and the effects of climate change/sea level rise result in loss of land or vehicular access to the island the significant beneficial impact would be lost.

### 4.8.5 ALTERNATIVE 3 – SUSTAINABLE RECREATION AND CLIMATE CHANGE ADAPTATION (NPS PREFERRED ALTERNATIVE)

- **Impact Analysis**

**Coastal Response Management Actions.** In alternative 3 the NPS would prepare for catastrophic storms and climate change/sea level rise by transitioning to sustainable design of facilities and infrastructure and by planning and developing alternative transportation systems.

Overall, this approach to contingency planning would have a beneficial impact on seashore operations over the long-term. The NPS would maintain visitor use facilities and infrastructure using an adaptive management approach. Visitor use facilities and infrastructure on the island would be reduced and their sustainability would increase. Facilities relocated to the mainland, where the potential for damage from catastrophic storms and climate change/sea level rise, would be reduced.

Contingency planning would enable relatively quick restoration of access to the seashore following the loss of vehicular access. The NPS would complete planning for implementation of water-based alternative transportation system (passenger ferry) for visitor access and seashore operations in advance of losing island vehicular access. As part of planning the NPS would have selected sites for facility development on the mainland and taken action to acquire the land from willing sellers and to complete required design and engineering of new facilities. Assuming funding would be available, the NPS would be immediately prepared to proceed with implementing the transportation contingency plans, including construction of docking facilities on the island and the mainland for the passenger ferry and for seashore operations. Overall, contingency planning would enable relatively quick restoration of access to the seashore following the loss of vehicular access due to catastrophic storms and the effects of climate change/sea level rise, resulting in a beneficial impact on seashore operations.

**Natural Resource Management Actions.** The loss of automobile access to the island and/or backcountry would add complexity to resource management functions owing to the logistical difficulties of water-based access. Should the size of the OSV use area decrease over time, the loss of access for public deer hunting could affect the ability to meet deer management objectives; in this event seashore managers would explore options and take actions to manage herd sizes, as appropriate. Resource management and protection staff would work with the states to enforce a prohibition on harvesting horseshoe crabs and to continue the state of Maryland's prohibition on commercial aquaculture within seashore waters (Maryland only), and to establish public oyster grounds. . Collectively these additional management actions would require staff time and management that further exceeds the seashore's current capacity and could have a long-term adverse impact on seashore operations.

**Cultural Resource Management Actions.** Cultural resource management actions would require additional resource management and maintenance capacity. At the Assateague Beach U.S. Coast Guard Station and Green Run Lodge future protection and stabilization of the dunes and shoreline to withstand storm damage more effectively would require ongoing maintenance. Adaptive reuse of Green Run Lodge would also require additional maintenance depending upon the type of use and potential partner involvement. Collectively these additional management actions would require staff time and management that further exceeds the seashore's current capacity and could have a long-term adverse impact on seashore operations.

**Visitor Use and Visitor Experience Management Actions.** Visitor use management would become more complex as use of the backcountry expands with the development of new bayside access points (e.g. camping reservation system, enhanced patrol and visitor protection needs) and acquisition of one to three new points of departure on the mainland. If natural coastal processes alter OSV access and use, the scope of required management activities would likely change. Reduced OSV access to the southern

portion of the seashore would likely require that some management activities become water-based. Should all automobile access be lost, overall visitation to the island would likely decline and reduce the demand for visitor use management, although the distribution of visitor use would remain relatively unchanged. The loss of traditional access would complicate emergency response, and likely require more staff with advanced training. Collectively these additional management actions would require staff time and management that further exceeds the seashore's current capacity and could have a long-term adverse impact on seashore operations.

**Seashore Operations Management Actions.** In alternative 3 existing management practices related to day-to-day seashore operations would change as the island developed area's visitor use infrastructure becomes more sustainable and as new opportunities to access the backcountry become available. Estimates of long-term staffing requirements for alternative 3 indicate a need for an additional 6 FTE staff (compared to 2012 staff levels). If funding is available to support the additional 6 FTE, there would be a beneficial impact on seashore operations because all positions would be filled that are needed maintain public use facilities and infrastructure, complete needed resource management and stewardship activities, and provide the full range of visitor services. If additional funding were not available, there would be an adverse impact on seashore operations due to approximately ten vacant positions at the seashore.

Replacement of the existing undersized and obsolete seashore headquarters complex at a new location would benefit seashore operations by facilitating more efficient and safe administrative and maintenance functions at the seashore.

**Partnerships and Volunteer Support.** In alternative 3, existing partnerships and cooperative relationships that support ongoing management would generally expand to focus on preparing for catastrophic storms and climate change/sea level rise by transitioning to sustainably designed facilities and infrastructure and by planning and developing alternative transportation systems. To address the potential effects of catastrophic storms and sea level rise, NPS would generally expand its partnerships with FWS and Assateague State Park to accomplish joint resilience planning more effectively. To prepare for the potential loss of land on the island and generally to enhance the sustainability of visitor use facilities, the NPS and Assateague State Park would expand their partnership to collaborate on finding mainland sites for jointly located facilities, including relocated island visitor use facilities, NPS administrative offices and maintenance facility, and various state park facilities. This would make the existing NPS visitor center site available for reuse for alternative transportation system infrastructure on the mainland. NPS and the state park would also seek to implement management actions that would enhance operational efficiency and cost effectiveness by co-locating and jointly operating facilities , sharing resources and expertise, and collaborating to

address conservation and resource management needs both on and off the island. Collectively these actions would have a beneficial impact on seashore operations.

Many expanded and new partnerships would have a beneficial impact on seashore operations. Partners in the scientific and educational communities would assist with efforts to enhance resource resiliency and climate change adaptation. Worcester County would become a more active partner with the NPS assisting with efforts to relocate recreational amenities to the mainland once the island cannot be accessed by vehicle. Commercial service providers would likely expand their support by making new and improved options available for accessing the island's backcountry from the mainland. A potential partnership at the Assateague Beach U.S. Coast Guard Station would likely reduce NPS maintenance responsibilities for historic structures and the cultural landscape.

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have impacts on seashore operations would be the same as those identified for alternative 1 (section 4.8.2).

The overall cumulative impacts on seashore operations would be primarily beneficial because NPS would increasingly manage lands within the seashore to better withstand the impacts of coastal processes and climate change/sea level rise. An adverse impact would also result from the uncertainty of federal and state funding to support staffing needed to manage public lands within the seashore's boundary. Alternative 3 would add an appreciable increment to the overall beneficial cumulative impact because NPS would operate its lands within the seashore's boundary with a contingency plan that would transition visitor facilities and infrastructure to more sustainable locations and designs, and because expanded and new partnerships and volunteer programs would facilitate more sustainable seashore operations. There would also be adverse cumulative impacts because of uncertainty of federal and state funding to support staffing needed to manage public lands within the seashore's boundary. Alternative 3 would add a perceptible increment to the adverse impact because of uncertainty of federal funding to support staffing needed to accomplish the seashore's purposes.

- **Conclusions**

In alternative 3 management actions would have both adverse and beneficial impacts on seashore operations and would add a noticeable adverse increment and an appreciable beneficial increment to the total cumulative impacts on seashore operations, respectively.

The seashore would operate with a contingency plan that would transition visitor facilities and infrastructure to more sustainable locations and designs, resulting in a

beneficial impact on seashore operations. Planning would begin immediately to position the seashore to relocate some visitor use facilities and infrastructure to sustainable locations on the adjacent mainland, resulting in a beneficial impact on seashore operations. The partnership with MD DNR at Assateague State Park would focus on preparing for catastrophic storms and climate change/sea level rise by transitioning to sustainably designed facilities and by planning and developing alternative transportations systems for visitor access and seashore operations in the event that vehicle access to the island is lost, resulting in a beneficial impact on seashore operations. Many expanded and new partnerships and volunteer programs would facilitate a broad range of functions needed to protect seashore resources and provide recreational opportunities for visitors, resulting in a beneficial impact on seashore operations. Overall, the beneficial impact on seashore operations would be significant because the contingency plan together with expanded partnerships, would expose the seashore to a low risk of becoming abruptly inaccessible by vehicle due to a catastrophic storm. The uncertainty as to whether the seashore would suddenly be unable to operate as needed would be largely eliminated.

Only if increased ONPS funding becomes available for approximately ten additional FTEs would staffing be adequate to maintain visitor use facilities and infrastructure, to complete needed resource management and stewardship activities, and to provide the full range of visitor services, resulting in an adverse impact on seashore operations. The adverse impact could be significant because of the uncertainty of ONPS funding to support the ten FTEs required for seashore operations. Without the ten FTEs, following a catastrophic storm that would make the island inaccessible by vehicle, the seashore might not have adequate staff to implement water-based operations needed to accomplish its purpose of providing high quality resource-compatible recreation opportunities and preserving the island's coastal resources.

### 4.8.6 ALTERNATIVE 4 – NATURAL ISLAND EVOLUTION AND A PRIMITIVE ISLAND EXPERIENCE

- **Impact Analysis**

**Coastal Response Management Actions.** In alternative 4 the NPS would prepare for catastrophic storms and sea level rise by replacing existing facilities as they are damaged or lost with minimalist facilities and by developing alternative transportation systems.

Overall, this approach to contingency planning would have a beneficial impact on seashore operations. Over the long-term the NPS would maintain existing facilities and infrastructure only until they become obsolete or are lost or damaged by catastrophic storms or the effects of climate change/sea level rise. Sustainably designed minimal facilities needed for day-use would replace what is lost or damaged, reducing the demand for long-term maintenance.

As in alternative 3, contingency planning would enable relatively quick restoration of access to the seashore following the loss of vehicular access. The NPS would have completed planning for implementation of a water-based alternative transportation system (passenger ferry) for visitor access and seashore operations in advance of losing island vehicular access. As part of planning the NPS would have selected sites for facility development on the mainland and taken action to acquire the land from willing sellers and to complete required design and engineering of new facilities. Assuming funding would be available the NPS would be immediately prepared to proceed with implementing the transportation contingency plans, including construction of docking facilities on the island and the mainland for the passenger ferry and for seashore operations. Overall, contingency planning would enable relatively quick restoration of access to the seashore following the loss of vehicular access due to catastrophic storms and the effects of climate change/sea level rise, resulting in a beneficial impact on seashore operations.

**Natural Resource Management Actions.** As in alternative 3, the loss of automobile access to the island and/or backcountry would add complexity to resource protection/management functions owing to the logistical difficulties of water-based access. As in alternative 3, should the size of the OSV use area decrease over time, the loss of access for public deer hunting could affect the ability to meet deer management objectives; in this event, seashore managers would explore options and takes actions to manage herd sizes, as appropriate. Resource management and protection staff would work with the states to enforce a prohibition on harvesting horseshoe crabs and to continue the state of Maryland's prohibition on commercial aquaculture within seashore waters (Maryland only), and to establish public oyster grounds. Collectively these additional management actions would require staff time and management that further exceeds the seashore's current capacity and could have a long-term adverse impact on seashore operations.

**Cultural Resource Management Actions.** Adaptive reuse of Green Run Lodge would require additional resource management and maintenance capacity depending upon the type of use and potential partner involvement. This would further exceed the seashore's current capacity and could have a long-term adverse impact on seashore operations.

**Visitor Use and Visitor Experience Management Actions.** If a breach occurs that limits (or eliminates) OSV use, the scope of required activities would be reduced. Restricted OSV access would likely require that some management activities become water-based. Should all automobile access to the island be lost, overall visitation to the island would likely decline, and become predominantly day-use, thus reducing the demand for and complexity of visitor use management. The loss of traditional access to the island would complicate emergency response, and likely require more staff with advanced training. Collectively these additional management actions would require staff time and

management that further exceeds the seashore's current capacity and could have a long-term adverse impact on seashore operations.

**Seashore Operations Management Actions.** In alternative 4 existing management practices related to day-to-day seashore operations would change as traditional recreational facilities and infrastructure are removed from the island and are replaced by smaller less developed backcountry facilities that do not accommodate large numbers of visitors. Estimates of long-term staffing requirements for alternative 4 indicate a need for an additional 6 FTE staff (compared to 2012 staff levels). If funding is available to support the additional 6 FTE, there would be a beneficial impact on seashore operations because all positions would be filled that are needed maintain public use facilities and infrastructure, complete needed resource management and stewardship activities, and provide the full range of visitor services. If additional funding were not available, there would be an adverse impact on seashore operations due to approximately ten vacant positions at the seashore.

**Partnerships and Volunteer Support**. In alternative 4 existing partnerships and cooperative relationships that support ongoing management would continue. NPS would generally expand its partnership with Assateague State Park to collaborate on finding mainland sites for jointly located facilities, including NPS administrative offices and maintenance facility, and various state park facilities. This would make the existing NPS visitor center site available for reuse for alternative transportation system infrastructure on the mainland. Collectively these actions would have a beneficial impact on seashore operations.

Replacement of the existing undersized and obsolete seashore headquarters complex at a new location would benefit seashore operations by facilitating more efficient and safe administrative and maintenance functions at the seashore.

A few expanded and new partnerships would have a beneficial impact on seashore operations. Partners in the scientific and educational communities would assist with efforts to enhance resource resiliency and climate change adaptation. Commercial service providers would likely expand their support by making new and improved options available for accessing the island's backcountry from the mainland.

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have impacts on seashore operations would be the same as those identified for alternative 1 (section 4.8.2).

The overall cumulative impacts on seashore operations would be primarily beneficial because NPS would increasingly manage lands within the seashore to better withstand the impacts of coastal processes and climate change/sea level rise. An adverse impact

would also result from the uncertainty of federal and state funding to support staffing needed to manage public lands within the seashore's boundary. Alternative 4 would add an appreciable increment to the overall beneficial cumulative impact because NPS would operate its lands within the seashore's boundary with a contingency plan that would prepare for catastrophic storms and the effects of climate change/sea level rise by replacing existing facilities as they are damaged or lost with facilities that support day-use only, and because expanded and new partnerships and volunteer programs would facilitate more sustainable seashore operations. There would also be adverse cumulative impacts because of uncertainty of federal and state funding to support staffing needed to manage public lands within the seashore's boundary. Alternative 4 would add a perceptible increment to the adverse impact because of uncertainty of federal funding to support staffing needed to accomplish the seashore's purposes.

- **Conclusions**

In alternative 4 management actions would have both adverse and beneficial impacts on seashore operations and would add an imperceptible adverse increment and an appreciable beneficial increment to the total cumulative impacts on sesshore operations, respectively.

The seashore would operate with a contingency plan that would prepare for catastrophic storms and the effects of climate change/sea level rise by replacing existing facilities as they are damaged or lost with facilities that support day-use only and by developing alternative transportation systems for visitor access and water-based operations, resulting in a beneficial impact on seashore operations. A few expanded and new partnerships and volunteer programs would facilitate a broad range of functions needed to protect seashore resources and provide recreational opportunities for visitors, resulting in a beneficial impact on seashore operations. The partnership with MD DNR at Assateague State Park would focus on finding mainland sites for jointly located administrative and maintenance facilities, resulting in a beneficial impact on seashore operations. Overall, the beneficial impact on seashore operations would be significant because the contingency plan together with a few expanded partnerships, would expose the seashore to a low risk of becoming abruptly inaccessible by vehicle due to a catastrophic storm. The uncertainty as to whether the seashore would suddenly be unable to operate as needed would be largely eliminated.

Only if increased ONPS funding becomes available for approximately ten additional FTEs would staffing be adequate to maintain visitor use facilities and infrastructure, to complete needed resource management and stewardship activities, and to provide the full range of visitor services, resulting in an adverse impact on seashore operations. The adverse impact could be significant because of the uncertainty of ONPS funding to support the ten FTEs required for seashore operations. Without the ten FTEs, following a catastrophic storm that would make the island inaccessible by vehicle, the seashore might not have adequate staff to implement water-based operations needed to

accomplish its purpose of providing high quality resource-compatible recreation opportunities and preserving the island's coastal resources.

## 4.9 Access and Circulation

### 4.9.1 METHODOLOGY

- **Methodology**

Analysis of impacts on access and circulation focuses on the need to provide sustainable access for visitors and seashore operations, specifically considering how well each alternative accomplishes the following:

- enables visitors to access and move around the seashore and to enable NPS staff to maintain the seashore and provide visitor services.
- reduces the risks of disruption or loss of access due to catastrophic storms and the effects of climate change/sea level rise
- enables access within the Maryland developed area that is sustainable and sufficient to support large numbers of visitors (including access needed for seashore operations)
- supports low density, low impact visitor use in the backcountry accessible by foot or by boat (except for the OSV use area) (including access needed for seashore operations)

The resource-specific context for the evaluation of impacts on seashore operations is as follows:

- Approximately 2 million people visit the seashore annually seeking recreation experiences on the beach, many of whom return year after year during family summer vacations. Most visitors arrive by private vehicle, although a growing number of visitors arrive by bus (approximately 44,000 in 2013). Some also arrive via commercial vessels (approximately 27,000 in 2013). Private motorized and non-motorized boats provide access for a small number of visitors, the majority of whom visit the seashore's north end.
- The seashore's enabling legislation explicitly states that one of the two purposes for the seashore is to provide high quality resource-compatible recreational opportunities for visitors.
- Opportunities for visitors to experience the seashore through a wide variety of active and passive recreational and educational opportunities are values that are fundamental to the seashore.
- The seashore currently lacks a contingency plan for mitigating the impacts from catastrophic storms and the effects of climate change/sea level rise. This raises uncertainty as to the sustainability of seashore access that is dependent upon bridges and roads that are highly susceptible to recurring damage.

- The seashore offers one of the few opportunities for oversand vehicle use on an undeveloped beach on the east coast of the United States. Many visitors to the seashore are there explicitly for recreational experiences made possible by OSV. A large stakeholder group of OSV users has expressed concern that the OSV use area remain in at least its current extent.
- In recent years, the north end of the seashore has gained popularity and is heavily used during summer months by visitors who access the north end beach by boat.
- NPS owns the bridges that provide land access to the seashore in Virginia; FHWA generally assists the NPS with bridge maintenance. The state of Maryland owns the only bridge that provides land access to the seashore in Maryland and controls how public funds are spent for maintenance.
- NPS owns and maintains the seashore roads that provide land access on the island in Maryland. FWS owns and maintains the refuge roads that provide land access to the Toms Cove assigned area (managed by the NPS within CNWR).

### 4.9.2 ALTERNATIVE 1 – CONTINUATION OF CURRENT MANAGEMENT

- **Impact Analysis**

**Coastal Response Management Actions.** The seashore would continue to lack a contingency plan for responding to catastrophic storms and the effects of climate change/sea level rise. NPS would manage seashore resources and visitor use as it does today, with no major change in scope or direction. There would be limited actions to protect transportation system infrastructure from storm damage. Recurring damage would occur due to coastal storms temporarily restricting or closing access to recreation experiences. Parking capacity on the island would be reduced as the developed area shrinks enabling fewer and fewer visitors to have vehicular access to the seashore. Over the long-term there would be an adverse impact on access and circulation.

Lack of a contingency plan would not mitigate the eventual impacts from catastrophic storms and climate change/sea level rise. The seashore would continue to be exposed to very high risk of becoming abruptly inaccessible by vehicle in the event that a catastrophic storm destroys the MD Route 611 bridge or breaches the island in the northern portion of the developed area. When that happens, without a contingency plan in place, access to the seashore could be lost for months to years, resulting in a long-term adverse impact on access and circulation.

Response to breaches and/or new inlet formation would be uncertain. As a result, in the future it is possible that some or all of the OSV use area and the backcountry could become inaccessible by vehicle and by walking, either temporarily or permanently. Should this occur, there would be an adverse impact on access and circulation.

**Natural Resource Management Actions.** Analysis of natural resource management actions identified no associated impacts on access and circulation.

**Cultural Resource Management Actions.** Repairs to the boat dock at the Assateague Beach U.S. Coast Guard Station would make it possible to continue to provide visitor access to the coast guard station via water. There would be a beneficial impact on access and circulation because when land access is closed due to piping plover (*Charadrius melodus*) activity, water access would be the only means of access to the station for seashore maintenance staff and visitors.

**Visitor Use and Visitor Experience Management Actions.** Analysis of visitor use and visitor experience management actions identified no associated impacts on access and circulation.

**Seashore Operations Management Actions.** Existing transportation system management practices would continue to support traditional access to the seashore via private passenger automobile with the following adverse impacts on access and circulation:

- Maintaining the entrance station on the island would continue to contribute to serious congestion on Bayberry Drive resulting in an adverse impact on access and circulation. Vehicles would continue to back up at the entrance station for long periods with the queue sometimes stretching more than one-quarter mile, blocking access for campers, impeding emergency access, and encouraging illegal parking that damages seashore resources and requires enforcement actions.
- Lack of management actions to reduce the number of vehicles within the Maryland developed area would continue to result in an adverse impact on access and circulation. Serious congestion would continue during summer months, caused by too many vehicles seeking desirable parking spaces close to recreational beaches and changing facilities. Illegal parking, particularly in areas that provide access to South Beach, would continue to pose safety problems, contribute to congestion, and damage coastal resources.
- Lack of an alternate means of access to the island would continue to have an adverse impact on access and circulation. During summer months, demand would continue to exceed capacity for access to visitor use facilities within the Maryland developed area. The seashore would continue to have 770 parking spaces within the Maryland developed area, well below the demand for parking on peak days that sometimes reaches as many as 2,000 spaces. Current management policy is to permit vehicles to enter the seashore even though spaces are not available, causing visitors to circulate through parking areas until a space becomes available or to park illegally alongside seashore roads, impeding emergency access and damaging seashore resources.

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have impacts on access and circulation generally include past, present, and planned/programmed investments in the transportation infrastructure in the communities providing access it. At the seashore the MD DNR (at Assateague State Park) and the FWS (at CNWR) have made investments in the transportation infrastructure to provide visitor access and facilitate seashore operations; each agency in the future will continue to invest in the seashore's transportation infrastructure, including development of new facilities as well as maintenance of existing facilities. Other actions affecting seashore access include existing and planned transportation system investments by local, county, and state governments in Worcester County (MD) and Accomack County (VA), including roads, bridges, trails, transit facilities, airports, navigation channels, and public access sites. Other actions also include the network of public access facilities along the shorelines of adjoining bay waters in Maryland and Virginia from which visitors can access the seashore by boat. In general, public agencies and local governments have taken few management actions to protect transportation system infrastructure from catastrophic storm damage and the effects of climate change/sea level rise. Management agencies generally repair recurring damage to transportation infrastructure from coastal storms in lieu of relocating facilities and/or developing alternative transportation options that could maintain access and circulation in the seashore vicinity more effectively in the event of catastrophic storms and the effects of climate change/sea level rise.

The overall cumulative impacts on access and circulation would be primarily adverse because contingency planning would continue to place the seashore at very high risk of losing access for months to years in the event that a catastrophic storm destroys transportation infrastructure that provides vehicular access to the island. Alternative 1 would add an appreciable increment to the overall adverse cumulative impact because transportation infrastructure on lands managed by the NPS would remain in non-sustainable locations subject to recurring damage and eventual loss as the island's land area continues to shrink, and because management actions would not address chronic overcrowding and excess demand for access to the seashore. There would also be beneficial cumulative impacts associated with minor transportation system improvements on public lands within the seashore's boundaries. Alternative 1 would add an imperceptible increment to the beneficial impact due to minor transportation system improvements on NPS lands and restoration of boat access to the Assateague Beach U.S. Coast Guard Station.

- **Conclusions**

In alternative 1 management actions would have both adverse and beneficial impacts on access and circulation and would add an appreciable adverse increment and an imperceptible beneficial increment to the total cumulative impacts on access and circulation, respectively.

Current management actions would result in adverse impacts on access and circulation because they would not address chronic access issues affecting the Maryland developed area during summer months including inadequate parking to meet demand, congestion within the Maryland developed area due to the presence of too many vehicles, and congestion on Bayberry Drive due to the presence of the entrance station on the island and the long queue of waiting vehicles that block access for campers, bikers, seashore management staff, and emergency vehicles. The seashore would continue to operate without a contingency plan for responding to catastrophic storms and the effects of climate change/sea level rise; transportation infrastructure would remain in non-sustainable locations subject to recurring damage and eventual loss as the island's land area continues to shrink, resulting in an adverse impact on access and circulation. Lack of a contingency plan would not mitigate the likely eventual impacts due to catastrophic storms and climate change/sea level rise.

The adverse impacts of alternative 1 on access and circulation would be significant. Adverse impacts would result because management actions would not address chronic overcrowding and excess demand for access to the seashore. The seashore would be at very high risk of losing access for months to years in the event that a catastrophic storm destroys transportation infrastructure that provides vehicular access to the island. As a result, the seashore would be unable to operate as needed to accomplish its purpose of providing recreation opportunities and preserving coastal resources. Only through congressional or state funding appropriated for emergency repairs could the seashore continue to be accessible by private vehicle. There would be uncertainty as to when access would be lost and how long it would take to restore access via reconstructed transportation infrastructure and/or development of a water-based transportation system. Loss of access to the island would be highly disappointing to seashore visitors, many of whom assume that they will be able to return to the seashore year after year to enjoy recreation experiences.

An adverse impact on access and circulation would also result if access to all or some of the OSV use area is lost. NPS would not seek to relocate OSV use to another area of the island. By allowing natural processes to predominate, access to the OSV use area would be reduced or lost. This would result in a significant adverse impact on access and circulation because access for some visitors to a variety of long-standing recreational uses on the beach would be reduced or eliminated. This would be controversial to some seashore visitors.

The beneficial impact of alternative 1 would result from repair of the boat dock at the Assateague Beach U.S. Coast Guard Station, making it possible for visitors and seashore maintenance staff to access the site by motorized vessels when overland routes are closed due to plover nesting. This impact would not be significant.

### 4.9.3 IMPACTS COMMON TO ALL ACTION ALTERNATIVES

- **Impact Analysis**

**Seashore Operations Management Actions.** In alternatives 2, 3, and 4 the NPS and MD DNR would explore the potential for a consolidated, jointly operated entrance station to the island located on the mainland. Relocation of the entrance station would manage more effectively the number of vehicles accessing the island and facilitating operation of a new visitor shuttle system. It would eliminate congestion in the Maryland developed area caused by back-ups at the existing NPS and state park entrance stations. It would also reduce the total number of vehicles on the island on peak days. In conjunction with these actions, the NPS would implement an alternative transportation system (ATS). Visitors arriving once parking capacity on the island is reached would have the option to park on the mainland and transfer to a shuttle that would take them to recreational beaches and other sites within the Maryland developed area. Collectively these actions would have a beneficial impact on access and circulation by reducing the number of vehicles on the island and the associated congestion in the Maryland developed area, by providing access to the island for visitors who would otherwise be turned away, and by eliminating congestion on Bayberry Drive caused by the current location of the seashore entrance station.

In alternatives 2, 3, and 4 implementation of an alternative transportation system (ATS) and relocation of the entrance station to the mainland would generally enhance the ability of NPS and MD DNR to sustain visitor access to the seashore. Future catastrophic storms and the effects of climate change/sea level rise would continue to reduce the land available for visitor use and transportation infrastructure within the developed area. By implementing an ATS in advance of the loss of land, the seashore in collaboration with MD DNR could progressively implement shuttle-based access to visitor use areas on the island. In this way, NPS would maintain access to the seashore without disruption as the Maryland developed area shrinks due to catastrophic storms and the effects of climate change/sea level rise. The decrease in vehicle parking capacity would require more visitors seeking island recreation experiences to use the mainland-based shuttle more frequently. At the same time, expansions to shuttle facilities would support a progressively larger shuttle operation, providing additional parking to meet growing demand, and offering service more frequently with more shuttle vehicles. Collectively these actions would have a beneficial impact on access and circulation. The beneficial impact could be short-term or long-term depending upon when vehicular access to the seashore is lost due to catastrophic storms and the effects of climate change/sea level rise.

### 4.9.4 ALTERNATIVE 2 – CONCENTRATED TRADITIONAL BEACH RECREATION

- **Impact Analysis**

**Coastal Response Management Actions.** The NPS would prepare for catastrophic storms and the effects of climate change/sea level rise by fortifying the Maryland developed area and letting the remainder of the island evolve naturally, driven by the full effects of natural coastal processes and climate change/sea level rise. The general lack of contingency planning would expose the NPS visitor use facilities on the island to very high risk of becoming abruptly inaccessible by vehicle. In that event, without a contingency plan in place access would be lost for months to years until the bridge is replaced or a water-based alternative transportation system (passenger ferry) for visitor access and seashore operations could be implemented. There would be an adverse impact on access and circulation.

Breach management protocols would generally seek to repair storm overwash and breaches in the island developed area and to let the island's backcountry areas evolve naturally – without interference – subject to the full effects of natural coastal processes and climate change/sea level rise. As a result, in the future it is possible that some or all of the OSV use area and the backcountry could become inaccessible by vehicle and by walking, either temporarily or permanently. This would result in an adverse impact on access and circulation (see Visitor Use and Visitor Experience Management Actions below).

**Natural Resource Management Actions.** Use of the north end beach would be restricted to limit resource impacts by implementing a permit system requiring a docking/mooring pass. While this action would address resource management concerns, it would have an adverse impact on seashore access and circulation by making it more difficult for visitors to plan trips by boat to a popular seashore recreation site.

**Cultural Resource Management Actions.** Analysis of cultural resource management actions identified no associated impacts on access and circulation.

**Visitor Use and Visitor Experience Management Actions.** OSV use would continue within a smaller designated OSV use area that is limited to the beach outside of the proposed wilderness (south of the island developed area to approximately KM 23.4). This would reduce the length of the OSV use area to 38 percent of its current size (from 19.4 KM to 7.4 KM), resulting in an adverse impact on access and circulation. NPS would not take action to restore access to the OSV use area if it is cut off by catastrophic storms or the effects of climate change/sea level rise (e.g., a persistent breach/new inlet occurs in the OSV use area). Should this occur, management actions would further reduce or eliminate the areas that OSVs could access, resulting in an adverse impact on access and circulation.

**Seashore Operations Management Actions.** Analysis of seashore operations management actions identified no associated impacts on access and circulation.

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have impacts on access and circulation would be the same as those identified for alternative 1 (section 4.9.2).

The overall cumulative impacts on access and circulation would be primarily adverse because contingency planning would continue to place the seashore at very high risk of losing access for months to years in the event that a catastrophic storm destroys transportation infrastructure that provides vehicular access to the island. Alternative 2 would add an appreciable increment to the overall adverse cumulative impact because transportation infrastructure on lands managed by the NPS would remain in locations that would be inherently not sustainable. There would also be beneficial cumulative impacts associated with transportation system improvements on public lands within the seashore's boundaries. Alternative 2 would add a perceptible increment to the beneficial impact because of management actions that would address some aspects of the chronic access issues affecting the Maryland developed area during summer months and restoration of boat access to the Assateague Beach U.S. Coast Guard Station.

- **Conclusions**

In alternative 2 management actions would have both adverse and beneficial impacts on access and circulation and would add an appreciable adverse increment and an imperceptible beneficial increment to the total cumulative impacts on access and circulation, respectively.

The seashore would operate without a contingency plan, maintaining transportation infrastructure in locations that would be inherently not sustainable resulting in an adverse impact on access and circulation. Only through ongoing congressional funding appropriated for construction and emergency repairs could the seashore continue to maintain transportation infrastructure and protect them from catastrophic storms and the effects of climate change/sea level rise. Congestion within the Maryland developed area due to the presence of too many vehicles would continue; vehicles would still enter the seashore until existing parking areas are full, resulting in an adverse impact on access and circulation.

Collectively these adverse impacts of alternative 2 on access and circulation would be significant. The seashore would be at very high risk of losing access for months to years in the event that a catastrophic storm destroys transportation infrastructure that provides vehicular access to the island. As a result, the seashore would be unable to operate as needed to accomplish its purpose of providing recreation opportunities and

preserving coastal resources. There would be uncertainty as to when access would be lost and how long it would take to restore access via reconstructed transportation infrastructure and/or development of a water-based transportation system. Loss of access to the island would be highly disappointing to seashore visitors, many of whom assume that they will be able to return to the seashore year after year to enjoy recreation experiences.

Adverse impacts on access and circulation would also result from reduction in the size of the OSV use area. The adverse impacts would be significant because by allowing natural processes to predominate, access to the beach for OSV use would be reduced. These actions would reduce or eliminate access for some visitors to a variety of long-standing recreational uses on the beach. This would be controversial to some seashore visitors. Furthermore, if access to all or some of the reduced OSV use area is lost, NPS would not seek to relocate OSV use to another area of the island. By allowing natural processes to predominate, access to the OSV use area would be reduced or lost. This would result in a significant adverse impact on access and circulation because access for some visitors to a variety of long-standing recreational uses on the beach would be reduced or eliminated. This would be controversial to some seashore visitors.

Management practices would address some aspects of the chronic access issues affecting the Maryland developed area during summer months, resulting in a beneficial impact on access and circulation. Moving the entrance station to the mainland would have a beneficial impact on access and circulation by eliminating chronic congestion on Bayberry Drive that currently blocks access for campers, bikers, seashore management staff, and emergency vehicles. While parking demand would continue to exceed capacity during summer months, visitors who could not access the island by private vehicle because parking lots are full would still be able to reach recreation sites via an alternative transportation system (shuttle), resulting in a beneficial impact on access and circulation.

Collectively these beneficial impacts on access and circulation within the Maryland developed area and the backcountry would be significant because they would support the seashore's purpose of providing access to recreation opportunities for visitors. In particular, implementation of an ATS that would enable visitors currently turned away to access the island by shuttle would significantly enhance the seashore's ability to provide access to recreation opportunities for visitors.

### 4.9.5 ALTERNATIVE 3 – SUSTAINABLE RECREATION AND CLIMATE CHANGE ADAPTATION (NPS PREFERRED ALTERNATIVE)

- **Impact Analysis**

**Coastal Response Management Actions.** The NPS would take steps to prepare for catastrophic storms and climate change/sea level rise by transitioning to sustainable

design facilities and infrastructure and by planning and developing alternative transportation systems. In the event that vehicular access is lost, the NPS would have completed planning for a water-based alternative transportation system for visitor access (passenger ferry) and seashore operations in advance of losing island vehicular access. As part of planning the NPS would have selected sites for facility development on the mainland and taken action to acquire the land from willing sellers and to complete required design and engineering of new facilities. The NPS would be immediately prepared to proceed with implementing the transportation contingency plans, including construction of docking facilities on the island and the mainland for the passenger ferry and for seashore operations. Overall, contingency planning would enable relatively quick restoration of access to the seashore following the loss of vehicular access due to catastrophic storms and the effects of climate change/sea level rise, resulting in a beneficial impact on access and circulation.

Breach management protocols would seek a reasonable balance that would generally let the island evolve naturally subject to the effects of natural coast processes and climate change/sea level rise within the context of human safety and protection of property. As a result, in the future it is possible that some or all of the OSV use area and the backcountry could become inaccessible by vehicle and by walking, either temporarily or permanently. Should this occur, there would be an adverse impact on access and circulation. This would be mitigated to some extent by relocating the OSV use area to another more suitable location (see Visitor Use and Visitor Experience Management Actions below).

**Natural Resource Management Actions.** As in alternative 2, access to the north end Beach by motorized vessels would be significantly reduced in order to limit resource impacts by implementing a permit system requiring a docking/mooring pass. While this action would address resource management concerns, it would have an adverse impact on seashore access by making it more difficult for visitors to plan trips by boat to a popular seashore recreation site.

**Cultural Resource Management Actions.** As in alternative 1, repairs to the boat dock at the Assateague Beach U.S. Coast Guard Station would make it possible to continue to provide visitor access to the coast guard station via water. There would be a beneficial impact on access and circulation because when land access is closed due to piping plover (*Charadrius melodus*) activity, water access would be the only means of access to the station for seashore maintenance staff and visitors.

**Visitor Use and Visitor Experience Management Actions.** OSV use would continue within the seashore's existing OSV use area. Also, NPS would consider modifying the OSV use area or relocating it to another more suitable location if it is cut off by catastrophic storms or the effects of climate change/sea level rise (e.g., a persistent breach/new inlet occurs in the OSV use area). As long as vehicular access to the isalnd

remains, there would be the potential to retain the length of the OSV use area at 100 percent of its current size (although the location could be changed), resulting in a potential beneficial impact on access and circulation.

The NPS would implement several management actions to enhance access to the backcountry by water. Three new bayside access points would be developed, including channel markers, a mooring area, and soft landing. NPS would seek to acquire from Worcester County two existing public access sites on the mainland. To promote the use of these sites for seashore access, the NPS would seek to expand and diversify partnerships with commercial service providers to provide both guided and self-guided water access to the seashore. Collectively these actions would result in a beneficial impact on access and circulation.

**Seashore Operations Management Actions.** When vehicular access to the island is no longer possible, access to the island would shift to a ferry based operation for visitor access and seashore operations at waterfront locations on the mainland and on the island. New mainland facilities near the existing seashore headquarter complex would include a passenger ferry terminal, docking facilities to support seashore operations, and parking for up to 700 cars; new island facilities would include an island terminal facility, docking facilities to support seashore operations, an island shuttle system with shelters and benches, and new trails. Planning for these facilities in advance of losing vehicular access to the seashore and their timely construction as soon as needed would sustain visitor access to the island with minimal interruption resulting in a beneficial impact on access and circulation.

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have impacts on access and circulation would be the same as those identified for alternative 1 (section 4.9.2).

The overall cumulative impacts on access and circulation would be primarily beneficial because of transportation system improvements on public lands within the seashore's boundaries, and because NPS would increasingly manage lands within the seashore to better withstand the impacts of coastal processes and climate change/sea level rise. Alternative 3 would add an appreciable increment to the overall beneficial cumulative impact because contingency planning would enable relatively quick restoration of access to the seashore following the loss of vehicular access via water-based alternative transportation system for visitor access (passenger ferry) and for seashore operations, and because NPS would implement actions to enhance access to the backcountry, restore water access to the Assateague Beach U.S. Coast Guard Station, and to address many aspects of the chronic access issues affecting the Maryland developed area during summer months. There would also be adverse cumulative impacts associated with reduced access in some areas of the seashore. Alternative 3 would add an

imperceptible increment to the adverse impact because of management actions to reduce visitor access via motorized vessels to the north end.

- **Conclusions**

In alternative 3 management practices would have both adverse and beneficial impacts on access and circulation and would add an imperceptible adverse increment and an appreciable beneficial increment to the total cumulative impacts on access and circulation, respectively.

Management practices would address many aspects of the chronic access issues affecting the Maryland developed area during summer months resulting in a beneficial impact on access and circulation. Moving the entrance station to the mainland would have a beneficial impact on access and circulation by eliminating chronic congestion on Bayberry Drive that currently blocks access for campers, bikers, seashore management staff, and emergency vehicles. While parking demand would continue to exceed capacity during summer months, visitors who could not access the island by private vehicle because parking lots are full would still be able to reach recreation sites via an alternative transportation system (shuttle), resulting in a beneficial impact on access and circulation. As catastrophic storms and the effects of climate change/sea level rise reduce the land area, parking would be reduced and would ultimately no longer be available. At that time, access would be available by shuttle only and vehicular congestion would no longer be an issue as long as recreational uses continue within the developed area. The seashore would also begin to transition to transportation infrastructure that would be more sustainable, including contingency planning to enable relatively quick restoration of access to the seashore following the loss of vehicular access via water-based alternative transportation system for visitor access (passenger ferry) and for seashore operations, resulting in a beneficial impact on access and circulation. Many aspects of backcountry access would continue to provide visitors with desired access to recreation opportunities and water-based access to the backcountry would be managed more effectively through implementation of a docking/mooring pass, also resulting in a beneficial impact on access and circulation. Management actions would also generally enhance access to the backcountry by water, including addition of three new bayside access points, along with enhanced partnerships with commercial service providers to provide both guided and self-guided water access to the seashore. The OSV use area would remain in its current size and location; NPS would consider modifying or relocating it to another location if it is cut off by catastrophic storms or the effects of climate change/sea level rise. As in alternative 1, the repair of the boat dock at the Assateague Beach U.S. Coast Guard Station, would make it possible for visitors and seashore maintenance staff to access the site by motorized vessels when overland routes are closed due to plover nesting.

The beneficial impacts on access and circulation within the Maryland developed area and the backcountry would be significant because they would support the seashore's

purpose of providing access to recreation opportunities for visitors. In particular, implementation of an ATS that would enable visitors currently turned away to access the island by shuttle would significantly enhance the seashore's ability to provide access to recreation opportunities for visitors. Furthermore, contingency planning would reduce to low the risk of long-term seashore inaccessibility due to a catastrophic storm. The NPS would be immediately prepared to proceed with implementing transportation contingency plans, including construction of docking facilities on the island and the mainland for a passenger ferry and for seashore operations, on-island shuttle and enhanced trail system, and acquisition of mainland public access sites for enhanced water access to the island. By potentially relocating the OSV use area in the event of a breach that will remain open, access to a long-standing recreational uses highly valued by seashore visitors would continue.

The adverse impact on access and circulation would result from implementation of a permit system requiring a docking/mooring pass for visitors to the north end. The adverse impact would be significant because by allowing natural processes to predominate, access to the north end Beach by motorized vessel would eliminate access for some to a variety of long-standing recreational uses in the north end. This would be controversial to some seashore visitors.

### 4.9.6 ALTERNATIVE 4 – NATURAL ISLAND EVOLUTION AND A PRIMITIVE ISLAND EXPERIENCE

- **Impact Analysis**

**Coastal Response Management Actions.** The NPS would prepare for catastrophic storms and sea level rise by replacing existing facilities as they are damaged or lost with minimalist facilities and by developing alternative transportation systems. This would require federal investment when existing facilities are lost or become obsolete, and assumes that funding would be appropriated at the necessary times. As in alternative 3, contingency planning would enable relatively quick restoration of access to the seashore following the loss of vehicular access. As in alternative 3, in the event that vehicular access is lost, the NPS would have completed planning for implementation of water-based alternative transportation system for visitor access (passenger ferry) and seashore operations in advance of losing island vehicular access. Overall, contingency planning would enable relatively quick restoration of access to the seashore following the loss of vehicular access due to catastrophic storms and the effects of climate change/sea level rise, resulting in a beneficial impact on access and circulation.

Breach management protocols would generally seek to let the island evolve naturally – without interference – subject to the full effects of natural coastal processes and climate change/sea level rise. As a result, in the future it is possible that some or all of the OSV use area and the backcountry could become inaccessible by vehicle and by walking, either temporarily or permanently. Should this occur, there would be an adverse impact

on access and circulation. As in alternative 3, this would be mitigated to some extent by relocating the OSV use area to another more suitable location (see Visitor Use and Visitor Experience Management Actions below).

**Natural Resource Management Actions.** Access to the north end Beach by motorized vessels would be curtailed. While this action would address resource management concerns, it would have an adverse impact on seashore access by eliminating access for most visitors to a popular recreation site.

**Cultural Resource Management Actions.** As in alternative 1, repairs to the boat dock at the Assateague Beach U.S. Coast Guard Station would make it possible to continue to provide visitor access to the coast guard station via water. There would be a beneficial impact on access and circulation because when land access is closed due to piping plover (*Charadrius melodus*) activity, water access would be the only means of access to the station for seashore maintenance staff and visitors.

**Visitor Use and Visitor Experience Management Actions.** OSV use would continue within the seashore's existing OSV use area. If vehicular access is lost (e.g., a persistent breach/new inlet occurs in the OSV use area and the breach management plan calls for it to stay open), then the OSV use area would be reduced or eliminated. This would result in an adverse impact on access and circulation.

NPS would seek to expand and diversify partnerships with commercial service providers to provide both guided and self-guided access to the seashore, resulting in a beneficial impact on access and circulation.

**Seashore Operations Management Actions.** As in alternative 3, when vehicular access to the island is no longer possible, access to the island would shift to a ferry based operation for visitor access and seashore operations at waterfront locations on the mainland and on the island. New mainland facilities would be similar to those in alternative 3, although parking capacity could be smaller; island facilities would be limited to an expanded trail system and would not include an island shuttle system. Planning for these facilities in advance of losing vehicular access to the seashore and their timely construction as soon as needed would sustain visitor access to the island with minimal interruption resulting in a beneficial impact on access and circulation.

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have impacts on access and circulation would be the same as those identified for alternative 1 (section 4.9.2).

Other past, present, and reasonably foreseeable actions that have had or would have impacts on access and circulation would be the same as those identified for alternative

4 (section 4.9.2). The overall cumulative impacts on access and circulation would be primarily beneficial because of transportation system improvements on public lands within the seashore's boundaries, and because NPS would increasingly manage lands within the seashore to better withstand the impacts of coastal processes and climate change/sea level rise. Alternative 4 would add an appreciable increment to the overall beneficial cumulative impact because contingency planning would enable relatively quick restoration of access to the seashore following the loss of vehicular access via water-based alternative transportation system for visitor access (passenger ferry) and for seashore operations, and because NPS would implement actions to restore water access to the Assateague Beach U.S. Coast Guard Station and to address many aspects of the chronic access issues affecting the Maryland developed area during summer months. There would also be adverse cumulative impacts associated with reduced access in some areas of the seashore. Alternative 4 would add a perceptible increment to the adverse impact because of management actions to eliminate visitor access via motorized vessels to the north end.

- **Conclusions**

In alternative 4 management practices would have both adverse and beneficial impacts on access and circulation and would add an imperceptible adverse increment and an appreciable beneficial increment to the total cumulative impacts on access and circulation, respectively.

Management practices would address some aspects of the chronic access issues affecting the Maryland developed area during summer months resulting in beneficial impacts on access and circulation. Moving the entrance station to the mainland would have a beneficial impact on access and circulation by eliminating chronic congestion on Bayberry Drive that currently blocks access for campers, bikers, seashore management staff, and emergency vehicles. While parking demand would continue to exceed capacity during summer months, visitors who could not access the island by private vehicle because parking lots are full would still be able to reach recreation sites via alternative transportation system (shuttle) resulting in a beneficial impact on access and circulation. Congestion within the Maryland developed area due to the presence of too many vehicles would continue; vehicles would still enter the seashore until existing parking areas are full, resulting in an adverse impact on access and circulation. Over the long-term congestion would worsen over time as the land area shrinks. As catastrophic storms and the effects of climate change/sea level rise reduce the land area, parking would be reduced and would ultimately no longer be available. At that time, access would be available by shuttle only and vehicular congestion would no longer be an issue as long as recreational uses continue within the developed area.

Many aspects of backcountry access would continue to provide visitors with desired access to recreation opportunities resulting in a beneficial impact on access and circulation. Management actions would also include enhanced partnerships with

commercial service providers to provide both guided and self-guided water access to the seashore, resulting in a beneficial impact on access and circulation. The OSV use area would remain in its current size and location, resulting in a beneficial impact on access and circulation. The seashore would begin to transition to transportation infrastructure that would be more sustainable, including contingency planning to enable relatively quick restoration of access to the seashore following the loss of vehicular access via water-based alternative transportation system for visitor access (passenger ferry) and for seashore operations, also resulting in a beneficial impact on access and circulation. As in alternative 1, the repair of the boat dock at the Assateague Beach U.S. Coast Guard Station, would make it possible for visitors and seashore maintenance staff to access the site by motorized vessels when overland routes are closed due to plover nesting.

The beneficial impacts on access and circulation within the Maryland developed area and the backcountry would be significant because they would support the seashore's purpose of providing access to recreation opportunities for visitors. In particular, implementation of an ATS that would enable visitors currently turned away to access the island by shuttle would significantly enhance the seashore's ability to provide access to recreation opportunities for visitors. Furthermore, contingency planning would reduce to low the risk of long-term seashore inaccessibility due to a catastrophic storm. The NPS would be immediately prepared to proceed with implementing transportation contingency plans, including construction of docking facilities on the island and the mainland for a passenger ferry and for seashore operations, on-island shuttle and enhanced trail system, and acquisition of mainland public access sites for enhanced water access to the island.

An adverse impact on access and circulation would result from elimination of access to the north end via motorized vessels. The adverse impact would be significant because by allowing natural processes to predominate, access for some visitors to a variety of long-standing recreational uses in the north end would be eliminated. This would be controversial to some seashore visitors.

If access to all or some of the OSV use area is lost, NPS would not seek to relocate OSV use to another area of the island. By allowing natural processes to predominate, access to the OSV use area would be reduced or lost. This would result in a significant adverse impact on access and circulation because access for some visitors to a variety of long-standing recreational uses on the beach would be reduced or eliminated. This would be controversial to some seashore visitors.

## 4.10 Visitor Use and Visitor Experience

### 4.10.1 METHODOLOGY

Analysis of impacts on visitor use and visitor experience focuses on maintaining and enhancing popular visitor experiences at the seashore, specifically considering how well each alternative accomplishes the following:

- provides visitor facilities and infrastructure the Maryland developed area and the Virginia developed area that support high-density activities and uses
- provides visitor opportunities within the backcountry for low density, low impact activities and uses
- provides visitors opportunities for oversand vehicle use
- provides visitor services that support desired visitor experiences
- offers interpretive and educational programs that tell all seashore stories and promote resource stewardship

The resource-specific context for the evaluation of impacts on visitor use and visitor experience is as follows:

- Approximately 2 million people visit the seashore annually seeking recreation experiences on the beach, many of whom return year after year during family summer vacations. The seashore currently lacks a contingency plan for mitigating the impacts from catastrophic storms and the effects of climate change/sea level rise. This raises uncertainty as to the sustainability of vehicular access to the seashore. Loss of vehicular access to seashore recreation experiences would be highly disappointing to the majority of visitors because they rely on personal automobiles for their beach or camping experience. A relatively small percentage of visitors would find loss of vehicular access attractive because the beach or camping experience would become more primitive.
- The seashore's enabling legislation explicitly states that two purposes for the seashore are to provide high quality resource-compatible recreational opportunities for visitors and to preserve the seashore's outstanding coastal resources and the natural processes upon which they depend.
- Opportunities for visitors to experience the seashore through a wide variety of active and passive recreational and educational opportunities are values that are fundamental to the seashore's purpose and significance.
- Public comment received during the GMP planning process indicated a strong desire for a seashore experience that is more primitive, less intensely developed, and with few visitor services.
- The seashore offers one of the few opportunities for oversand vehicle (OSV) use on an undeveloped beach on the east coast of the United States. Many visitors to the seashore are there explicitly for recreational experiences made

possible by OSVs. A large stakeholder group of OSV users has expressed concern that the OSV use area remain in at least its current extent.

- The Assateague Island Wilderness offers one of the few opportunities for a coastal wilderness experience in the eastern United States.

### 4.10.2 ALTERNATIVE 1 – CONTINUATION OF CURRENT MANAGEMENT

- **Impact Analysis**

**Coastal Response Management Actions.** NPS would seek to maintain a variety of traditional beach-oriented recreational activities concentrated within the Maryland developed area for as long as possible without fortification. Despite efforts to protect the Maryland developed area through dune maintenance, catastrophic storms and the effects of climate change/sea level rise would continue to reduce the land area within the Maryland developed area. Over the long-term visitor use facilities would likely be non-sustainable due to lack of funding for maintenance and ultimately due to the shrinking island land area. As the land area shrinks, maintenance of recreational uses would likely become impossible. Overall, this coastal response management approach would result in an adverse impact on visitor use and visitor experience because recreational uses would continue at high risk with the potential for very long-term interruption or complete loss.

**Natural Resource Management Actions.** Continuation of existing natural resource management programs to restore seashore habitat disturbed by historic land uses would have a beneficial impact on visitor experience by eliminating abandoned buildings, roads, mosquito ditches, and impoundments that detract from the seashore's natural setting in the backcountry.

Access to the OSV use area and to the Assateague Beach U.S. Coast Guard Station would continue to be restricted as needed to protect habitat of the piping plover (*Charadrius melodus*).

**Cultural Resource Management Actions.** At the Assateague Beach U.S. Coast Guard Station, the NPS would maintain current management practices. All structures would be maintained. Repairs to the boat dock would make it possible to continue to provide visitor access to the coast guard station via water. When land access is closed due to piping plover (*Charadrius melodus*) activity, water access would be the only means of access to the station.

NPS would not take action to protect or stabilize the ocean dunes or bay shoreline now or in the event of future storm damage to the dune or shoreline. This would increase the potential for damage or loss of historic structures at the coast guard station by natural coastal processes and/or the effects of climate change/sea level rise. When the station structures could no longer be maintained, NPS would likely demolish the station

complex and rehabilitate the site to foster a return to natural conditions. This would result in a long-term adverse impact on visitor use and visitor experience because opportunities to visit the historic structures and cultural landscape would be lost.

**Visitor Use and Visitor Experience Management Actions.** Backcountry hiking and camping opportunities would be maintained, with access by foot or boat only. Visitors would continue to be able to hunt throughout the backcountry during the public hunting season, with access by some portions of backcountry roads.

The designated OSV use area would remain without management changes, maintaining the existing use limit set at 145 vehicles. As long as vehicular access to the Maryland developed area is maintained visitors could experience beach recreation uses via vehicular access generally as they do today.

Visitor services would remain as they are today with no change in the method of delivery and location. The seashore's two visitor centers would provide orientation and information for visitors. Non-personal services would make available additional information via the internet, site bulletins, exhibits, waysides, and other media. Traditional ranger led activities would continue. Commercial service providers would sell camping supplies at a small convenience store and offer kayak rentals. Visitor use facilities would be maintained but not upgraded. Collectively these services would continue to support the desired visitor experience at the seashore. Public comment received during the planning process indicates that visitors generally enjoy the existing level of visitor services offered at the seashore and that the existing level of commercial services is consistent with their desired experience. As a result, visitor services associated with alternative 1 would continue to have a beneficial impact on visitor use and visitor experience.

**T**he NPS would continue interpretive and educational programs as they are today with no change in the method of delivery and location, and thematic message. Existing management programs and practices providing interpretive and educational services would tell the desired range of seashore stories and provide the desired range of educational programs, although with limited opportunities for in-depth learning and immersion experiences. Traditional ranger led activities and curriculum-based programs concentrating on early childhood education would continue. Outreach to underserved communities would continue to be limited and accomplished primarily in association with partners. Collectively these actions would result in a beneficial impact on visitor use and visitor experience for as long as island visitor use facilities and access remain as they are today. Over time, as the island shrinks and vehicular access becomes more constrained or is lost, the capacity for NPS to tell stories and provide education programs would become more limited and would not be guaranteed. As that happens the impact of alternative 1 on visitor use and visitor experience would shift from a beneficial impact to an adverse impact.

**Seashore Operations Management Actions.** Continuation of current management without provision of an alternative transportation system (ATS) would have an adverse impact on visitor use and visitor experience. Seashore visitation would likely no longer continue to grow at the historic rate of one percent per year (US DOT 2013b). Capacity for additional visitors would be limited to the spring, fall, and winter when parking is typically available for all visitors making the trip to the seashore. During summer months, when parking capacity is reached on most days, more visitors would be forced to wait in a long line at the entrance gate for parking to become available; more would likely leave voluntarily because they chose not to wait.

In the future, when vehicular access is lost, visitation would reduce dramatically. Only visitors arriving by boat would be able to visit the seashore. Over the long-term, the lack of contingency planning to sustain access to the seashore would result in an adverse impact on visitor use and visitor experience because most visitors would no longer be able to get to the seashore.

NPS would continue to lack a comprehensive strategy for addressing overcrowding due to the number of vehicles and the number of visitors seeking to use popular recreation sites within the Maryland developed area. Without a change in management, as the land area shrinks vehicular congestion and overcrowding would worsen, further diminishing the quality of the visitor experience. Maintaining the entrance station on the island would continue to contribute to serious congestion on Bayberry Drive. Illegal parking, particularly in areas that provide access to South Beach, would continue to pose safety problems and contribute to congestion. Visitor density on shrinking recreational beaches would increase, leading to general uncertainty among visitors about being able to enjoy their desired summer holiday experience, disappointment for visitors seeking a more peaceful recreation experience in a natural setting, and overall higher potential for visitor conflicts

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have impacts on visitor use and visitor experience generally include past, present, and planned development of visitor use facilities and infrastructure as well as interpretive and educational programming by the U.S. Fish and Wildlife Service at the Chincoteague National Wildlife Refuge. Other actions also include past, present, and planned/programmed investments in the transportation infrastructure in the communities providing access to it as described for cumulative actions related to seashore access and circulation in section 4.9.2.

The overall cumulative impacts on visitor use and visitor experience would be primarily adverse because contingency planning would continue to place the seashore at very high risk of losing access for months to years in the event that a catastrophic storm destroys transportation infrastructure that provides vehicular access to the island.

Alternative 1 would add an appreciable increment to the overall adverse cumulative impact because contingency planning would continue to expose recreational uses throughout the seashore to high risk with the potential for abrupt and very long-term interruption or complete loss, and because management actions would not address chronic overcrowding and excess demand for access to the seashore. There would also be beneficial cumulative impacts associated with management actions that would continue to ensure that visitors have opportunities for traditional activities and experiences at the seashore. Alternative 1 would add an imperceptible increment to the beneficial impact associated with continued maintenance of visitor facilities programs.

- **Conclusions**

In alternative 1 management actions would have both adverse and beneficial impacts on visitor use and visitor experience and would add an appreciable adverse increment and an imperceptible beneficial increment to the total cumulative impacts on visitor use and visitor experience, respectively.

As long as there is vehicular access to the seashore, current management actions in alternative 1 would continue to ensure that visitors have opportunities for traditional activities and experiences at the seashore, resulting in a beneficial impact on visitor use and visitor experience. When vehicular access to the seashore is lost, current management practices in alternative 1 would expose recreational uses throughout the seashore to high risk with the potential for abrupt and very long-term interruption or complete loss resulting in an adverse impact on visitor use and visitor experience. The adverse impacts on visitor use and visitor experience would be significant because the seashore would no longer fulfill its purpose to provide high quality recreation opportunities to most visitors. There would be uncertainty as to when access would be restored via reconstructed transportation infrastructure and/or development of a water-based transportation system. There would also be uncertainty as to whether congressional or state funding would be appropriated for emergency repairs. Loss of access to the island would be disappointing to seashore visitors, most of which assume that they will be able to return to the seashore year after year via private automobile to enjoy recreation experiences. It would be especially controversial to OSV users because access to one of the few opportunities for OSV use on an undeveloped beach on the east coast of the United States would be lost. For a relatively small percentage of visitors, there would be a beneficial impact on the visitor experience because the beach or camping experience would become more primitive.

An adverse impact on visitor use and visitor experience would also result if access to all or some of the OSV use area is lost. NPS would not seek to relocate OSV use to another area of the island. By allowing natural processes to predominate, access to the OSV use area would be reduced or lost. This would result in a significant adverse impact on visitor use and visitor experience because access for some visitors to a variety of long-

standing recreational uses on the beach would be reduced or eliminated. This would be controversial to some seashore visitors.

A beneficial impact of alternative 1 would result from repair of the boat dock at the Assateague Beach U.S. Coast Guard Station, making it possible for visitors and seashore maintenance staff to access the site by motorized vessels when overland routes are closed due to plover nesting. This impact would not be significant.

### 4.10.3 IMPACTS COMMON TO ALL ACTION ALTERNATIVES

**Seashore Operations Management Actions.** In alternatives 2, 3, and 4 implementation of an alternative transportation system (ATS) would have a beneficial impact on visitor use and visitor experience. Seashore visitation could continue to grow at the historic rate of one percent per year (US DOT 2013b) as capacity for additional visitors would be available year-round. During summer months, when parking capacity is reached on most days, visitors would have the option of parking on the mainland and riding the ATS to the beach. While some visitors would continue to wait in a line at the entrance gate for parking to become available, many would choose to ride the ATS in lieu of not waiting. Many visitors who would otherwise have left without entering the seashore would be able to ride the shuttle instead.

In alternatives 2, 3, and 4 the NPS and MD DNR would explore the potential for a consolidated, jointly operated entrance station to the island located on the mainland. Relocation of the entrance station would manage more effectively the number of vehicles accessing the island and facilitate operation of the ATS. It would eliminate congestion in the Maryland developed area caused by back-ups at the existing NPS and state park entrance stations. It would also reduce the total number of vehicles on the island on peak days. In conjunction with these actions, the NPS would implement an alternative transportation system (ATS) giving visitors the option to park on the mainland and transfer to a shuttle that would take them to recreational beaches and other sites within the Maryland developed area. Collectively these actions would have a beneficial impact on visitor use and visitor experience by generally reducing the number of vehicles and the associated congestion in the Maryland developed area.

### 4.10.4 ALTERNATIVE 2 – CONCENTRATED TRADITIONAL BEACH RECREATION

- **Impact Analysis**

**Coastal Response Management Actions.** NPS would maintain existing visitor use facilities and infrastructure in the Maryland developed area through fortification for as long as suitable land base exists and funding is available to support fortification measures. There would be a gradual consolidation of visitor use facilities within a smaller area as the developed area contracts, initially to reduce the area requiring protection and ultimately in response to catastrophic storms and the effects of climate change/sea level rise. NPS would repair or replace damaged facilities within the limits

of available funding. Despite efforts to protect the Maryland developed area through fortification, over the long-term visitor use facilities would likely be non-sustainable due to lack of funding for fortification and ultimately due to the shrinking island land area. As the land area shrinks, maintenance of recreational uses would likely become impossible. Overall, this management approach would result in an adverse impact on visitor use and visitor experience because the number and quality of recreational facilities is likely to decrease as the developed area shrinks in size, and because recreational uses would continue at high risk with the potential for very long-term interruption or complete loss. In comparison to alternative 1 this impact would occur later due to the fortification investment, which would protect the developed area for a longer time than dune maintenance alone as proposed in alternative 1.

**Natural Resource Management Actions.** Other impacts associated with natural resource management actions in alternative 2 would be similar to those described for alternative 1 (section 4.10.2).

In addition, use of the north end beach would be restricted to limit resource impacts by restricting high density use. While this action would address resource management concerns, it would have an adverse impact on visitor use and visitor experience because it would reduce boat access to a popular recreation site.

**Cultural Resource Management Actions.** The former Assateague Beach U.S. Coast Guard Station and the former Green Run Lodge would not be maintained and would not be reopened for public use. There would be an adverse impact on visitor use and visitor experience because opportunities to visit the station and lodge would be permanently lost.

**Visitor Use and Visitor Experience Management Actions.** Visitor overcrowding would increase as the land area within the Maryland developed area shrinks. Visitor use limits would be required to address overcrowding, restricting the number of visitors who can access the island on a daily basis. Increased crowding would have an adverse impact on visitor use and visitor experience because the quality of the visitor experience would be diminished. Implementation of use limits would also have an adverse impact on visitor use and visitor experience because it would be impossible for all visitors wanting to access the island to be able to do so.

OSV use would continue within a smaller designated OSV use area that is limited to the beach outside of the proposed wilderness (south of the island developed area to approximately KM 23.4). This would reduce the length of the OSV use area to 38 percent of its current size (from 19.4 KM to 7.4 KM), resulting in an adverse impact on visitor use and visitor experience. Also, NPS would not take action to restore access to the OSV use area if it is cut off by catastrophic storms or the effects of climate change/sea level rise (e.g., a persistent breach/new inlet occurs in the OSV use area).

This would further reduce or eliminate the areas that OSVs could access, resulting in an adverse impact on visitor use and visitor experience.

The method of delivery and location for visitor services would transition over time as the seashore directs more of its resources towards sustaining traditional recreational activities in the Maryland developed area. Visitor center services would remain largely unchanged. Non-personal services, particularly the use of social media, would likely increase as the preferred medium for providing information. As the island's developed zone contracts there would be a shift away from organized programs towards more informal roving interpretive activities. New facilities would be concentrated within the developed zone to enhance recreational opportunities and services, and existing infrastructure within the developed zone would be upgraded to improve visitor amenities. Existing campgrounds within the developed zone would be upgraded, with water and electricity provided to all sites with hard pads. Commercial services providers would play an increasingly important role in providing visitors with opportunities to experience different aspects of the seashore. Commercial services would include an expanded camp store where groceries and prepared foods would be available. Convenience equipment rentals for camping and beach going would be available. Expanded lifeguard services would open up additional areas of protected beach. Collectively these management actions would change the seashore experience within the developed zone to a more intensely developed less primitive and natural experience. Public comment received during the planning process has indicated that most visitors generally prefer the existing seashore experience with developed campgrounds and amenities as they are today; they do not have a strong interest in additional amenities and visitor services. As a result, the visitor service enhancements included in alternative 2 would not support the public's desired visitor experience. Overall, there would be an adverse impact on visitor use and visitor experience.

The NPS would initially continue existing management programs and practices providing interpretive and educational services that tell the desired range of seashore stories and that provide the desired range of educational programs. As in alternative 1, this would be possible for as long as island visitor use facilities and access remain as they are today, resulting in a beneficial impact on visitor use and visitor experience. Over time as the Maryland developed area is fortified, reduced in size, and managed with an emphasis on maintaining recreational uses, the complexity of interpretive and educational programming would decrease, become less flexible, and increasingly focus on orientation, information, and safety. Curriculum-based environmental education programs would likely decrease in scope as resources are gradually redirected towards the traditional summer visitor. There would be a shift away from organized programs towards more informal roving interpretive activities. As a result, the depth and breadth of interpretive and educational programming would be greatly reduced and opportunities to tell all the seashore's stories would diminish, potentially becoming

impossible over time. As this happens the impact of alternative 2 on visitor use and visitor experience would shift from a beneficial impact to an adverse impact.

**Seashore Operations Management Actions.** As long as there is vehicular access to the seashore and adequate land area remains within the Maryland developed area, visitation would likely continue to grow at the historic rate of one percent per year (US DOT 2013b) (see section 4.10.3 impacts common to all action alternatives). This would be possible due to implementation of an alternative transportation system. There would be a beneficial impact on visitor use and visitor experience. However, at some point, visitor use limits might be required to address overcrowding due to loss of land mass within the Maryland developed area; this would restrict the number of visitors who could access the island, capping visitation or perhaps reducing it resulting in an adverse impact on visitor use and visitor experience.

In the future, when vehicular access is lost, visitation would reduce dramatically. In alternative 2 (as in alternative 1), only visitors arriving by boat would be able to visit the seashore. Over the long-term, the lack of contingency planning to sustain access to the seashore would result in an adverse impact on visitor use and visitor experience because most visitors would no longer be able to get to the seashore. This dramatically reduced level of visitation would remain low indefinitely, until road and bridge repairs could be made or planning and development of water-based access could be implemented.

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have impacts on visitor use and visitor experience would be the same as those identified for alternative 1 (section 4.10.2).

The overall cumulative impacts on visitor use and visitor experience would be primarily adverse because contingency planning would continue to place the seashore at very high risk of losing access for months to years in the event that a catastrophic storm destroys transportation infrastructure that provides vehicular access to the island. Alternative 2 would add an appreciable increment to the overall adverse cumulative impact because contingency planning would continue to expose recreational uses throughout the seashore to high risk with the potential for abrupt and very long-term interruption or complete loss, and because management actions would not address chronic overcrowding and excess demand for access to the seashore. There would also be beneficial cumulative impacts associated with management actions that would continue to ensure that visitors have opportunities for traditional activities and experiences at the seashore. Alternative 2 would add an imperceptible increment to the beneficial impact associated with continued maintenance of visitor facilities.

- **Conclusions**

In alternative 2 management actions would have both adverse and beneficial impacts on visitor use and visitor experience and would add an appreciable adverse increment and an imperceptible beneficial increment to the total cumulative impacts on visitor use and visitor experience, respectively.

As long as there is vehicular access and the land area within the Maryland developed is effectively protected, management actions would have a beneficial impact on visitor use and visitor experience. They would ensure that visitors have opportunities for traditional activities and experiences at the seashore, enhanced by actions that reduce congestion and visitor crowding and made more accessible through implementation of an alternative transportation system.

As long as there is vehicular access to the seashore, other management actions would have adverse impacts on visitor use and visitor experience in alternative 2. As the Maryland developed area is fortified and visitor use becomes more concentrated within a smaller and smaller area, the visitor experience would change to a more intensely developed visitor experience supported by more and different types of visitor services. Based on public comment received during the GMP planning process these management actions would not support the public's desire for a more primitive, less intensely developed visitor experience with fewer visitor services. As a result, the modifications to visitor services in alternative 2 would result in an adverse impact on visitor use and visitor experience that would be significant. Other management actions with immediate adverse impacts on visitor use and visitor experience in the backcountry would include limiting use at the north end beach and reducing the OSV use area to 38 percent of its current size. These adverse impacts would be significant because they would be disappointing to seashore visitors and would reduce opportunities for popular recreation uses and experiences. Management actions would also reduce the area available for OSV use at one of the few remaining locations open to OSV use on the east coast of the United States.

When vehicular access to the seashore is lost, management practices in alternative 2 would expose recreational uses throughout the seashore to high risk with the potential for abrupt and very long-term interruption or complete loss resulting in a long-term adverse impact on visitor use and visitor experience. The adverse impacts on visitor use and visitor experience would be significant because the seashore would no longer fulfill its purpose to provide high quality recreation opportunities to most visitors. There would be uncertainty as to when access would be restored via reconstructed transportation infrastructure and/or development of a water-based transportation system. There would also be uncertainty as to whether congressional or state funding would be appropriated for emergency repairs. Loss of access to the island would be disappointing to seashore visitors, most of which assume that they will be able to return to the seashore year after year via private automobile to enjoy recreation experiences.

It would be especially controversial to OSV users because access to one of the few opportunities for OSV use on an undeveloped beach on the east coast of the United States would be lost. For a relatively small percentage of visitors, there would be a beneficial impact on the visitor experience because the beach or camping experience would become more primitive.

Adverse impacts on visitor use and visitor experience would also result from reduction in the size of the OSV use area and loss of public access to the former Assateague Beach U.S. Coast Guard Station and the former Green Run Lodge. The adverse impacts would be significant because by allowing natural processes to predominate, access to the beach for OSV use would be reduced. These actions would reduce or eliminate access for some visitors to a variety of long-standing recreational uses on the beach. This would be controversial to some seashore visitors. Furthermore, if access to all or some of the reduced OSV use area is lost, NPS would not seek to relocate OSV use to another area of the island. By allowing natural processes to predominate, access to the OSV use area would be reduced or lost. This would result in a significant adverse impact on visitor use and visitor experience because access for some visitors to a variety of long-standing recreational uses on the beach would be reduced or eliminated. This would be controversial to some seashore visitors.

### 4.10.5 ALTERNATIVE 3 – SUSTAINABLE RECREATION AND CLIMATE CHANGE ADAPTATION (NPS PREFERRED ALTERNATIVE)

- **Impact Analysis**

**Coastal Response Management Actions.** NPS would make decisions about which visitor use facilities to repair or replace within the Maryland developed area based on a cost-benefit analysis of their sustainability in the face of catastrophic storms and the effects of climate change/sea level rise. To the extent possible existing visitor uses would be retained within the developed area as long as possible. Once land is no longer available to support sustainable facilities, the uses would be relocated to the mainland, if feasible. Ultimately, visitor use within the developed area would evolve to day-use only. Overall, this management approach would likely prolong the time during which existing visitor uses could be retained on the island while simultaneously preparing for the time when they could no longer be sustained. Contingency planning would ensure that existing visitor uses could be replaced with minimal disruption once island facilities must be abandoned. Collectively these actions would have a beneficial impact on visitor use and visitor experience.

**Natural Resource Management Actions.** Use of the north end Beach would be restricted to limit resource impacts by implementing a permit system requiring a docking/mooring pass. While this action would address resource management concerns, it would have an adverse impact on visitor use and visitor experience because it would reduce boat access to a popular recreation site.

Other impacts associated with natural resource management actions in alternative 3 would be similar to those described for alternative 1 (section 4.10.2).

**Cultural Resource Management Actions.** As in alternative 1, at the Assateague Beach U.S. Coast Guard Station the NPS would maintain current management practices. All structures would be maintained. Repairs to the boat dock would make it possible to continue to provide visitor access to the coast guard station via water. When land access is closed due to piping plover (*Charadrius melodus*) activity, water access would be the only means of access to the station, resulting in a beneficial impact on visitor use and visitor experience. Over time, the NPS would take action to protect or stabilize the ocean dunes or bay shoreline. This would help to protect the coast guard station from damage or loss by natural coastal processes and/or the effects of climate change/sea level rise resulting in a beneficial impact on visitor use and visitor experience. As investments are made by NPS's partner(s) in rehabilitating the station structures, there would be additional incentives and financial resources available from a partner organization for further protecting and stabilizing the dunes and shoreline. As a result it would likely be possible to maintain the structures in situ for a longer time, resulting in a longer-term beneficial impact on visitor use and visitor experience. However, over time the protection and stabilization measures would likely be unable to provide adequate protection. When the station structures could no longer be maintained the NPS would likely demolish the station complex and rehabilitate the site to foster a return to natural conditions. At that time there would be an adverse impact on visitor use and visitor experience because opportunities to visit the historic structures and cultural landscape would be lost.

**Visitor Use and Visitor Experience Management Actions.** The NPS would implement several management actions to enhance access to the backcountry by water. Three new bayside access points would be developed, including channel markers, a mooring area, and soft landing. NPS would seek to acquire from Worcester County two existing public access sites on the mainland. To promote the use of these sites for seashore access, the NPS would seek to expand and diversify partnerships with commercial service providers to provide both guided and self-guided water access to the seashore. Collectively these actions would result in a beneficial impact on visitor use and visitor experience.

New facilities for environmental education on Egging Island would expand opportunities to experience the backcountry. An improved soft landing for canoes and kayaks would enable visitors to more easily access the island, where a new primitive group campsite would offer new opportunities for camping and environmental education programming. There would be a beneficial impact on visitor use and visitor experience.

OSV use would continue within the seashore's existing OSV use area. Also, NPS would consider modifying the OSV use area or relocating it to another more suitable location if

it is cut off by catastrophic storms or the effects of climate change/sea level rise (e.g., a persistent breach/new inlet occurs in the OSV use area). As long as vehicular access to the island remains, there would be the potential to retain the length of the OSV use area at 100 percent of its current size (although the location could be changed), resulting in a beneficial impact on visitor use and visitor experience.

The method of delivery and location for visitor services would expand over time as seashore operations become more sustainable and efficient. While continuing to provide basic services and information, the two existing visitor centers would increasingly become centers of learning. As opportunities for visitor use expand on both the island and mainland, opportunities for visitor services would also expand. When implemented, staff would make use of points of departure such as ferry terminals and shuttle staging areas to provide orientation, safety messaging, and basic information. Non-personal services, particularly the use of social media, would expand as the preferred medium for providing information with an increased emphasis placed on providing comprehensive information on resource issues. Existing visitor services would continue to support the desired visitor experience. Commercial service providers would continue to offer canoe rentals and camping supplies at a small convenience store. As part of the seashore's new alternative transportation system, new commercial service providers would assist with access to the island backcountry from new points of departure on the mainland. As shifts are made in visitor facilities and infrastructure to more sustainable locations the level of visitor amenities, particularly at campgrounds, would generally remain as they are today. Public comment received during the planning process has indicated that most visitors generally prefer the existing seashore experience and do not have a strong interest in additional amenities and visitor services. As a result, the visitor service enhancements included in alternative 3 would support the public's desired visitor experience. Overall, there would be a beneficial impact on visitor use and visitor experience.

The NPS would continue and expand existing management programs and practices providing interpretive and educational programs that tell the desired range of seashore stories and that provide in-depth learning opportunities that promote resource stewardship. There would be more opportunities to tell all the seashore's stories to a greater range of audiences through more diverse experiences. As opportunities for visitor use expand on both the island and mainland, opportunities for interpretation and educational programming would also increase. The emphasis of existing management programs and practices providing interpretive and educational services would shift to climate change response, ocean stewardship, and other resource management issues. Sustainability messaging would become an essential part of all education and interpretive programs. Environmental education programs would be expanded with more opportunities for outreach, education, in-depth learning, and immersion that promote resource stewardship. Recreational programming would begin to emphasize more activities and experiences that promote resource stewardship. Collectively these

actions would have a beneficial impact on visitor use and visitor experience because the depth and breadth of interpretive and educational programming would be expanded and diversified.

**Seashore Operations Management Actions.** As long as there is vehicular access to the seashore, seashore visitation would likely continue to grow at the historic rate of one percent per year (US DOT 2013b) due to implementation of an alternative transportation system, resulting in a beneficial impact on visitor use and visitor experience (see section 4.10.3 impacts common to all action alternatives).

In the future, when vehicular access is lost, visitation would initially reduce dramatically. In alternative 3 (as in alternatives 1 and 2), only visitors arriving by boat would be able to visit the seashore. However, unlike alternatives 1 and 2, in alternative 3 this dramatically reduced level of visitation would continue for one to two years while previously completed plans for development of water-based access to the seashore would be implemented. Once the ferry is operational and as visitors become familiar with its use, annual visitation levels would begin to increase. Availability of an island shuttle and other visitor service would increase the likelihood of visitation increasing to levels prior to loss of vehicular access. Overall, there would be a beneficial impact on visitor use and visitor experience because visitors who previously arrived by vehicle would once again be able to get to the seashore.

An island-based ATS would disperse visitors over the land remaining within the Maryland developed area. This management approach would reduce visitor crowding, resulting in a beneficial impact on visitor use and visitor experience.

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have impacts on visitor use and visitor experience would be the same as those identified for alternative 1 (section 4.10.2).

The overall cumulative impacts on visitor use and visitor experience would be primarily beneficial because of management actions that would continue to ensure that visitors have opportunities for traditional activities and experiences at the seashore. Alternative 3 would add an appreciable increment to the overall beneficial cumulative impact because management actions would ensure that visitors have opportunities for traditional activities and experiences at the seashore, enhanced by actions that reduce congestion and visitor crowding and made more accessible through implementation of an alternative transportation system. Furthermore, contingency planning would ensure that over the long-term recreational uses within the Maryland developed area would continue at low risk for abrupt and long-term interruption or complete loss. There would also be adverse cumulative impacts associated with reduced access in some areas of the seashore. Alternative 3 would add an imperceptible increment to the adverse

impact because of management actions to reduce visitor access via motorized vessels to the north end.

- **Conclusions**

In alternative 3 management actions would have both adverse and beneficial impacts on visitor use and visitor experience and would add an imperceptible adverse increment and an appreciable beneficial increment to the total cumulative impacts on visitor use and visitor experience, respectively.

Overall, in alternative 3 there would be a shift in the type of seashore visitors. The seashore's current visitors who seek a beach experience with full amenities or camping in a developed campground would experience an adverse impact on their visitor experience; many would likely seek those experiences elsewhere. Conversely, visitors who are willing to access recreation opportunities by water and alternative transportation and to experience those opportunities in a more natural setting would experience a beneficial impact on their visitor experience.

As long as there is vehicular access, management actions would have a beneficial impact on visitor use and visitor experience, as in alternative 2. They would ensure that visitors have opportunities for traditional activities and experiences at the seashore, enhanced by actions that reduce congestion and visitor crowding and made more accessible through implementation of an alternative transportation system. The OSV use area would remain in its current size and location; NPS would consider modifying or relocating it to another location if it is cut off by catastrophic storms or the effects of climate change/sea level rise. As in alternative 1, the repair of the boat dock at the Assateague Beach U.S. Coast Guard Station, would make it possible for visitors and seashore maintenance staff to access the site by motorized vessels when overland routes are closed due to plover nesting. Unlike alternative 2, in alternative 3 management would also prolong the time during which the desired seashore visitor uses and experiences are available for visitors on the island while making similar uses possible on the mainland when they can no longer be sustained on the island.

When vehicular access to the seashore is lost, contingency planning in alternative 3 would have a beneficial impact on visitor use and visitor experience because access would be guaranteed via a passenger ferry with only a short-term interruption required to implement previously developed ATS plans and because access would be enhanced by additional visitor use facilities and visitor services to support boat access from the mainland. The beneficial impact would be significant. Over the long-term recreational uses within the Maryland developed area would continue at low risk for abrupt and long-term interruption or complete loss. While there would still be uncertainty as to when vehicular access would be lost, there would be certainty as to how long it would take to restore access via development of a water-based transportation system. Loss of access to the island would be less disappointing to some seashore visitors because there

would be a plan in place to restore seashore access to visitors, many of whom assume that they will be able to return to the seashore year after year to enjoy recreation experiences.

An adverse impact on visitor use and visitor experience would result from implementation of a permit system requiring a docking/mooring pass for visitors to the north end. The adverse impact would be significant because by allowing natural processes to predominate, access to the north end Beach by motorized vessel would eliminate access for some to a variety of long-standing recreational uses in the north end. This would be controversial to some seashore visitors.

As in alternative 1, the repair of the boat dock at the Assateague Beach U.S. Coast Guard Station, would result in a beneficial impact on visitor use and visitor experience by making it possible for visitors and seashore maintenance staff to access the site by motorized vessels when overland routes are closed due to plover nesting. This impact would not be significant.

### 4.10.6 ALTERNATIVE 4 – NATURAL ISLAND EVOLUTION AND A PRIMITIVE ISLAND EXPERIENCE

- **Impact Analysis**

**Coastal Response Management Actions.** Visitor use facilities within the Maryland developed area that are damaged or lost would be replaced with minimalist facilities in sustainable locations. Visitor uses would transition quickly to day-use only with some primitive campsites. Overall, the response to storm damage would have an adverse impact on visitor use and visitor experience within the Maryland developed area because many visitor uses would change quickly, with some eliminated. However, as in alternative 3, contingency planning would have a beneficial impact on visitor use and visitor experience because access to the island for day-use and primitive camping opportunities would be guaranteed via a passenger ferry with only a short-term interruption required to implement previously developed ATS plans.

**Natural Resource Management Actions.** Visitor access to the north end via motorized vessels would be prohibited. While this action would address resource management concerns, it would have an adverse impact on visitor use and visitor experience because it would eliminate a popular recreational use at the seashore.

Other impacts on visitor use and visitor experience associated with natural resource management actions in alternative 4 would be similar to those described for alternative 1 (section 4.10.2).

**Cultural Resource Management Actions.** At the Assateague Beach U.S. Coast Guard Station, the NPS would maintain current management practices, as in alternative 1.

Collectively these actions would result in a short-term beneficial impact on visitor use and visitor experience. Over time, when the coast guard station is lost due to natural coastal processes and the effects of climate change/sea level rise the visitor experience at the coast guard station would be lost resulting in a long-term adverse impact on visitor use and visitor experience.

**Visitor Use and Visitor Experience Management Actions.** As in alternative 3, OSV use would continue within the seashore's existing OSV use area. Also, NPS would consider modifying the OSV use area or relocating it to another more suitable location if it is cut off by catastrophic storms or the effects of climate change/sea level rise (e.g., a persistent breach/new inlet occurs in the OSV use area). As long as vehicular access to the island remains, there would be the potential to retain the length of the OSV use area at 100 percent of its current size (although the location could be changed), resulting in a beneficial impact on visitor use and visitor experience.

Existing visitor services would continue, although the relative mix of services, location, and thematic emphasis would gradually shift as the seashore becomes less developed and less accessible. The seashore's two visitor centers would provide orientation and information for visitors. Greater emphasis would be placed on visitor orientation due to changes in seashore accessibility. Resources currently used for on-site programs would be redirected to other services as the seashore shifts to more of a day-use destination. Early childhood education would likely contract as access to and from the seashore becomes more challenging. Non-personal services and web-based information would become a much more important means of communicating with the public about how to access and use the seashore. The thematic emphasis in seashore interpretive and educational programs would shift to climate change messages and information related to the expanding role of the seashore as a laboratory for studying climate change/sea level rise. While opportunities for telling stories and for educational programs would become less flexible and less diverse over time, environmental education programs would be greatly expanded, making available more and new opportunities for in-depth learning that promotes resource stewardship. Collectively these actions would have a beneficial impact on visitor use and visitor experience.

**Seashore Operations Management Actions.** As long as there is vehicular access to the seashore, seashore visitation would likely continue to grow at the historic rate of one percent per year (US DOT 2013b) due to implementation of an alternative transportation system, resulting in a beneficial impact on visitor use and visitor experience (see section 4.10.3 impacts common to all action alternatives).

In the future, when vehicular access is lost, visitation would initially reduce dramatically. In alternative 4 (as in alternatives 1, 2 and 3), only visitors arriving by boat would be able to visit the seashore in Maryland. However, unlike alternatives 1 and 2, in alternative 4 (as in alternative 3) this dramatically reduced level of visitation would continue for one

to two years while previously completed plans for development of water-based access to the seashore would be implemented. Once the ferry is operational and as visitors become familiar with its use, annual visitation levels would begin to increase. Unlike alternative 3, lack of an island shuttle and reduced level of visitor services would likely deter some visitors, inhibiting return to visitation levels prior to loss of vehicular access. However, overall there would be a beneficial impact on visitor use and visitor experience because visitors who previously arrived by vehicle would once again be able to get to the seashore.

New facility development would include development of up to 150 primitive campsites, replacing developed campsites lost to natural coastal processes and the impacts of climate change/sea level rise. This would have a beneficial impact on visitor use and visitor experience by maintaining camping opportunities on the island, although the range of camping opportunities would diminish as RV campsites are lost and not replaced. For those visitors preferring a more primitive experience this would be a benefit, while those seeking to camp in RVs and more developed campground settings this would be an adverse impact.

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have impacts on visitor use and visitor experience would be the same as those identified for alternative 1 (section 4.10.2).

The overall cumulative impacts on visitor use and visitor experience would be primarily beneficial because of management actions that would continue to ensure that visitors have opportunities for traditional activities and experiences at the seashore. Alternative 4 would add an appreciable increment to the overall beneficial cumulative impact because management actions would ensure that visitors have opportunities for traditional activities and experiences at the seashore, enhanced by actions that reduce congestion and visitor crowding and made more accessible through implementation of an alternative transportation system. Furthermore, contingency planning would ensure that over the long-term recreational uses within the Maryland developed area would continue at low risk for abrupt and long-term interruption or complete loss. There would also be adverse cumulative impacts associated with reduced access in some areas of the seashore. Alternative 4 would add a perceptible increment to the adverse impact because of management actions to eliminate visitor access via motorized vessels to the north end.

- **Conclusions**

In alternative 4 management actions would have both adverse and beneficial impacts on visitor use and visitor experience and would add an imperceptible adverse increment

and an appreciable beneficial increment to the total cumulative impacts on visitor use and visitor experience, respectively.

Overall, in alternative 4 there would be a shift in the type of seashore visitors. The seashore's current visitors who seek a beach experience with full amenities or camping in a developed campground would experience an adverse impact on their visitor experience; many would likely seek those experiences elsewhere. Conversely, over time as facilities are removed from the island and replaced with fewer more primitive facilities, visitors who prefer more solitude in a more natural setting would experience a beneficial impact on their visitor experience.

As long as there is vehicular access, management actions would have a beneficial impact on visitor use and visitor experience, as in alternatives 2 and 3. They would ensure that visitors have opportunities for traditional activities and experiences at the seashore, enhanced by actions that reduce congestion and visitor crowding and made more accessible through implementation of an alternative transportation system.

When vehicular access to the seashore is lost, contingency planning in alternative 3 would have a beneficial impact on visitor use and visitor experience because access would be guaranteed via a passenger ferry with only a short-term interruption required to implement previously developed ATS plans and because access would be enhanced by additional visitor use facilities and visitor services to support boat access from the mainland. The beneficial impact would be significant. Over the long-term recreational uses within the Maryland developed area would continue at low risk for abrupt and long-term interruption or complete loss. While there would still be uncertainty as to when vehicular access would be lost, there would be certainty as to how long it would take to restore access via development of a water-based transportation system. Loss of access to the island would be less disappointing to some seashore visitors because there would be a plan in place to restore seashore access to visitors, many of whom assume that they will be able to return to the seashore year after year to enjoy recreation experiences.

As long as there is vehicular access to the seashore other management actions would have adverse impacts on visitor use and visitor experience in alternative 4 because many visitor uses would change quickly, with some eliminated and some having the potential for long-term interruption. This adverse impact would not be significant because the quality of some visitor experiences that are fundamental to the seashore would be greatly enhanced and over the long-term most recreation opportunities for visitors that are interrupted would be restored.

An adverse impact on visitor use and visitor experience would result from elimination of access to the north end via motorized vessels. The adverse impact would be significant because by allowing natural processes to predominate, access for some visitors to a

variety of long-standing recreational uses in the north end would be eliminated. This would be controversial to some seashore visitors.

If access to all or some of the OSV use area is lost, NPS would not seek to relocate OSV use to another area of the island. By allowing natural processes to predominate, access to the OSV use area would be reduced or lost. This would result in a significant adverse impact on visitor use and visitor experience because access for some visitors to a variety of long-standing recreational uses on the beach would be reduced or eliminated. This would be controversial to some seashore visitors.

As in alternative 1, the repair of the boat dock at the Assateague Beach U.S. Coast Guard Station, would result in a beneficial impact on visitor use and visitor experience by making it possible for visitors and seashore maintenance staff to access the site by motorized vessels when overland routes are closed due to plover nesting. This impact would not be significant.

## 4.11 Socio-Economic Environment

### 4.11.1 METHODOLOGY

Seashore management actions by the NPS at the Maryland District have the potential to impact the socio-economic environment of local communities. Analysis of impacts on the socio-economic environment focuses on how seashore management in the Maryland District would affect local communities, specifically considering the extent to which each alternative accomplishes the following:

- management actions help to sustain tourism that directly and indirectly benefits the local economy
- visitor use and seashore operations are compatible with existing land uses and planning recommendations for gateway communities in the seashore vicinity
- resource management and land protection actions help to accomplish state and local land preservation goals

This analysis does not consider impacts associated with visitation at Assateague State Park and how it could be affected by management decisions by MD DNR in response to natural coastal processes and the effects of climate change/sea level rise.

In Virginia, the impacts of seashore management on the socio-economic environment of local communities are determined primarily by management decisions of the FWS at Chincoteague National Wildlife Refuge, including management actions that are assigned by the FWS to the NPS for providing public recreation opportunities in the Toms Cove area. As a result, the analysis of impacts on the socio-economic environment focuses on the impacts of NPS management actions in the Maryland District.

The resource-specific context for the evaluation of impacts on the socio-economic environment is as follows:

- Approximately 2.1 million people visited the seashore annually on average from 2004 through 2013. Approximately 60 percent of the visitation occurs 40 percent of the visitation occurs in the Maryland District at the Toms Cove area in Virginia (US DOT 2012). Analysis of historic visitation counts over the decade from 2000 to 2009 has indicated that if visitation growth continues at the same rate (one percent over ten years), visitation to the seashore would increase by approximately 8,000 visitors per year (US DOT 2012).
- In 2009, economic benefits of the seashore to local communities included creation of 2,173 jobs and value added equal to $100.36 million (NPS 2011c).
- The seashore currently lacks a contingency plan for mitigating the impacts from catastrophic storms and the effects of climate change/sea level rise. This raises uncertainty as to the sustainability of seashore access that is dependent upon bridges and roads that are highly susceptible to recurring damage. Should the MD 611 bridge (Verrazano Bridge) be lost, most tourists now visiting the seashore would not be able to get there. As a result, most of the associated economic benefits to local communities would be lost.
- The MD 611 corridor south of Assateague Road (MD 376) is the sole means of vehicular access to the seashore in Maryland and is the area within which the greatest potential impacts on gateway communities could occur because of seashore management actions.
- The annual value of horseshoe crab harvesting in the Toms Cove area of the seashore is estimated at a maximum of approximately $55,261 (US FWS 2015).

### 4.11.2 ALTERNATIVE 1 – CONTINUATION OF CURRENT MANAGEMENT

- **Impact Analysis**

**Coastal Response Management Actions.** Continued lack of contingency planning to maintain access to the island would have an adverse impact on the socio-economic envrionment (see seashore operations management actions).

**Natural Resource Management Actions**. NPS would continue to support local land preservation efforts in Worcester and Accomack Counties by providing technical assistance to county departments and to non-profit conservation organizations, and by partnering in the Maryland Coastal Bays Program. NPS would continue to not participate in local land preservation efforts as a partner engaged in land protection by fee purchase or easement conveyance. This level of involvement in local land preservation efforts would result in a minor beneficial impact on the socio-economic environment.

NPS would continue to not enforce existing federal laws prohibiting horseshoe crab harvest, resulting in a beneficial impact to some commercial watermen. The horseshoe crab industry in the Toms Cove area is estimated at a maximum of approximately $55,261 dollars (US FWS 2015).

**Cultural Resource Management Actions.** Analysis of cultural resource management actions identified no associated impacts on the socio-economic environment.

**Visitor Use and Visitor Experience Management Actions.** Analysis of visitor use and visitor experience management actions identified no associated impacts on the socio-economic environment.

**Seashore Operations Management Actions.** Seashore visitation would likely no longer continue to grow at the historic rate of one percent per year (US DOT 2013b). Potential growth in visitation has become increasingly constrained in recent years due to lack of adequate parking during the peak summer period. During summer months when demand to visit the seashore is highest, parking capacity is typically reached early in the day; many potential visitors are deterred from making the trip at all, knowing that parking may not be available. Consequently, capacity for future growth in visitation is largely limited to the spring, fall, and winter when demand is relatively low and parking is typically available for all visitors making the trip to the seashore.

Overall, because of these constraints, the future rate of growth in annual visitation in alternative 1 could decline as parking becomes increasingly difficult. This visitation trend would likely continue for as long as vehicular access to the seashore remains and adequate land area exists to provide parking at its current or reduced capacity. Given these conditions, by 2023 (ten years following GMP implementation) annual recreation visits would likely reach approximately 843,000 (table 4.1). Visitors (non-local and local) would spend approximately $63.2 million annually. Non-local visitor spending alone would generate approximately 818 jobs, $20.3 million in labor income, and $39.2 million in value added. Overall visitation and visitor spending associated with alternative 1 would continue to have a beneficial economic impact on the region as long as vehicular access is maintained, although this impact would be reduced when compared to the existing condition.

In the future, when vehicular access is lost, visitation and beneficial economic impacts of visitor spending would reduce dramatically when compared to baseline conditions (table 4.1). Projections for such an outcome – assumed for hypothetical purposes in 2024 – indicate that annual recreation visits could drop to approximately 67,000, including only visitors arriving by private boats or on commercial vessels. Visitor spending (non-local and local) would also drop to approximately $3.2 million annually, representing only five percent of prior year visitor spending. Non-local visitor spending

**Table 4.1 Estimated Local-Level Impacts of NPS Visitor Spending on Local Economies – Alternative 1 (Maryland)**

| Year | GMP Management Context | Public Use | | Visitor Spending | | Impacts of Non-Local Visitor Spending | | |
|---|---|---|---|---|---|---|---|---|
| | | Recreation Visits (MD only) | Overnight Stays | All Visitors ($000s) | Non-Local Visitors ($000s) | Jobs | Labor Income ($000s) | Value Added ($000s) |
| 2023 | visitation trends and access continue from 2014 through 2023 | 842,631 | 31,223 | 63,186 | 59,975 | 818 | 20,290 | 39,193 |
| 2024 | vehicular access is lost (hypothetical) | 67,132 | 1,561 | 3,159 | 2,999 | 41 | 1,014 | 1,960 |
| 2029 | no vehicular or water-based access (hypothetical) | 67,132 | 1,561 | 3,159 | 2,999 | 41 | 1,014 | 1,960 |
| 2034 | no vehicular or water-based access (hypothetical) | 67,132 | 1,561 | 3,159 | 2,999 | 41 | 1,014 | 1,960 |

[1] *Source: Derived from visitor spending estimates in NPS 2013b*

annually would generate only approximately 40 jobs, $1.0 million in labor income, and $2.0 million in value added. This dramatically reduced level of visitor spending and the associated beneficial economic impacts would remain low indefinitely, until road and bridge repairs could be made or planning and development of water-based access could be implemented.

Implementation of other seashore operations management actions by NPS in alternative 1 affecting land use in the MD 611 corridor would have a negligible impact on the socio-economic environment. The NPS would maintain its existing seashore headquarters complex, visitor center, and wastewater treatment facilities on the mainland in the MD 611 corridor. Future changes in land use and traffic patterns in the MD 611 corridor from Assateague Road (MD 376) to the seashore would result from market-driven private investments that would occur irrespective of management actions by the NPS at the seashore. Other changes could occur in the MD 611 corridor if MD DNR decides to build additional facilities on land it recently acquired.

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have impacts on the socio-economic environment generally include development on private property, public development projects, transportation system improvements, and growth management programs that have resulted in or could result in changes in the intensity of economic activity. This ongoing activity will continue to produce moderate

long-term growth in the overall regional economy, based largely on the tourism industry and agriculture.

The overall cumulative impacts on the socio-economic environment would be primarily adverse because contingency planning would continue to place the seashore at very high risk of losing access for months to years in the event that a catastrophic storm destroys transportation infrastructure that provides vehicular access to the island. Alternative 1 would add an appreciable increment to the overall adverse cumulative impact because contingency planning would continue to expose recreational uses throughout the seashore to high risk with the potential for abrupt and very long-term interruption or complete loss, with ensuing associated abrupt decline in visitor spending and loss of jobs, labor income, and value added to the local economy. There would also be beneficial cumulative impacts associated with management actions that would continue to ensure that visitors have opportunities for traditional activities and experiences at the seashore as long as there is vehicular access to the seashore. As long as there is vehicular access to the island, alternative 1 would add an appreciable increment to the beneficial impact associated with continued access to recreation experiences.

- **Conclusions**

In alternative 1 management actions would have both adverse and beneficial impacts on the socio-economic environment and would add an appreciable adverse increment and an apppreciable beneficial increment (as long as vehicular access is possible) to the total cumulative impacts on the socio-economic environment, respectively.

As long as there is vehicular access to the seashore, current management actions in alternative 1 would continue to ensure that visitors have opportunities for traditional activities and experiences at the seashore, resulting in a beneficial impact on the socio-economic environment. The beneficial impact would be significant because management actions would continue to maintain existing levels of visitation with associated visitor spending, job generation, labor income, and value added to the local economy.

When vehicular access to the seashore is lost, current management practices in alternative 1 would expose recreational uses throughout the seashore to high risk with the potential for abrupt and very long-term interruption or complete loss resulting in an adverse impact on the socio-economic environment. The adverse impacts on the socio-economic environment would be significant because when vehicular access is lost visitor spending would drop to approximately 5 percent of its previous levels, with similar drops in job generation, labor income, and value added to the local economy. There would be uncertainty as to when access would be restored via reconstructed transportation infrastructure and/or development of a water-based transportation system. There would also be uncertainty as to whether congressional or state funding

would be appropriated for emergency repairs. The decline in visitation and associated visitor spending would be upsetting to local businesses that are dependent upon seashore visitors and local residents who are employed in the tourism industry.

Continuation of the horseshoe crab harvesting would continue to result in beneficial impacts to some commercial watermen (US FWS 2015).

Other management actions affecting gateway community land use in the MD 611 corridor would have a negligible impact on the socio-economic environment. Continuation of NPS's current role in local land preservation efforts would have a minor beneficial impact on the socio-economic environment.

### 4.11.3 IMPACTS COMMON TO ALL ACTION ALTERNATIVES

**Natural Resource Management Actions.** Enforcement of existing federal laws prohibiting harvest of horseshoe crabs (as proposed by FWS in the Final CCP/EIS) would effectively eliminate illegal horseshoe crab harvesting in the Toms Cove area, likely resulting in a negative impact to some commercial watermen (US FWS 2015). The annual value of horseshoe crab harvesting in the Toms Cove area is estimated at approximately $55,261 (US FWS 2015).

**Seashore Operations Management Actions.** In alternatives 2, 3, and 4 implementation of an alternative transportation system and fortification of the Maryland developed area would enable seashore visitation to continue to grow at the historic rate of one percent per year. This rate of growth would continue as long as vehicular access to the seashore continues and adequate land area exists. By 2023 (ten years following GMP implementation) annual recreation visits would reach approximately 909,000 (tables 4.2, 4.3 and 4.4). Visitors (non-local and local) would spend approximately $68.1 million annually. Non-local visitor spending alone would generate approximately 882 jobs, $21.9 million in labor income, and $42.3 million in value added. Overall visitation and visitor spending associated with alternatives 2, 3, and 4 would have a beneficial economic impact on the region as long as vehicular access is maintained.

In alternatives 2, 3, and 4 NPS would develop a new consolidated, jointly operated entrance station (with MD DNR) within an expanded MD 611 right-of-way near the Verrazano Bridge, near existing NPS and MD DNR operations facilities. NPS would also complete rehabilitation of the previous visitor center as a stand-alone environmental education center. These investments would likely occur on existing public land owned by the NPS, MD DNR, or MD DOT with the impact confined to the MD 611 corridor near existing NPS and MD DNR operations facilities. These investments would not alter the character of the MD 611 corridor beyond the entrance station vicinity and would not induce new private development within the MD 611 corridor. Overall, implementation of management actions by NPS common to alternatives 2, 3, and 4 affecting land use in

the MD 611 corridor would have a negligible impact on the socio-economic environment.

### 4.11.4 ALTERNATIVE 2 – CONCENTRATED TRADITIONAL BEACH RECREATION

- **Impact Analysis**

**Coastal Response Management Actions.** Continued lack of contingency planning to maintain access to the island would have an adverse impact on the socio-economic envrionment (see seashore operations management actions).

**Natural Resource Management Actions**. As in alternative 1, in alternative 4 NPS would continue to support local land preservation efforts in Worcester and Accomack Counties (section 4.11.2).

**Cultural Resource Management Actions.** Analysis of cultural resource management actions identified no associated impacts on the socio-economic environment.

**Visitor Use and Visitor Experience Management Actions.** Analysis of visitor use and visitor experience management actions identified no associated impacts on the socio-economic environment.

**Seashore Operations Management Actions.** In alternative 2, as in alternatives 3 and 4, implementation of an alternative transportation system and fortification of the Maryland developed area would enable seashore visitation to continue to grow at the historic rate of one percent per year. Overall visitation and visitor spending associated with alternatives 2, 3, and 4 would have a beneficial economic impact on the region as long as vehicular access is maintained (see section 4.11.3).

In the future, once vehicular access is lost, seashore visitation would reduce dramatically. In alternative 2 (as in alternative 1), only visitors arriving by boat would be able to visit the seashore in Maryland. Over the long-term, the lack of contingency planning to sustain access to the seashore would result in an adverse impact on the socio-economic environment because most visitors would no longer be able to get to the seashore. This dramatically reduced level of visitation would remain low indefinitely, until road and bridge repairs could be made or planning, and development of water-based access could be implemented. Projections for such an outcome – assumed for hypothetical purposes in 2024 – indicate that annual recreation visits could drop to 70,000. Visitors spending (non-local and local) would drop to approximately $3.4 million annually, representing only five percent of prior year visitor spending (table 4.2). Non-local visitor spending annually would generate only approximately 44 jobs, $1.1 million in labor income, and $2.1 million in value added. This dramatically reduced level of visitor spending and the associated beneficial economic impacts would remain low indefinitely, until road and bridge repairs could be made or planning and

**Table 4.2 Estimated Local-Level Impacts of NPS Visitor Spending on Local Economies – Alternative 2 (Maryland)**

| Year | GMP Management Context | Public Use | | Visitor Spending | | Impacts of Non-Local Visitor Spending | | |
|---|---|---|---|---|---|---|---|---|
| | | Recreation Visits (MD only) | Overnight Stays | All Visitors ($000s) | Non-Local Visitors ($000s) | Jobs | Labor Income ($000s) | Value Added ($000s) |
| 2023 | visitation trends and access continue from 2014 through 2023 | 908,807 | 33,675 | 68,148 | 64,686 | 882 | 21,883 | 42,271 |
| 2024 | vehicular access is lost (hypothetical) | 70,440 | 1,684 | 3,407 | 3,234 | 44 | 1,094 | 2,114 |
| 2029 | no vehicular or water-based access (hypothetical) | 70,440 | 1,684 | 3,407 | 3,234 | 44 | 1,094 | 2,114 |
| 2034 | no vehicular or water-based access (hypothetical) | 70,440 | 1,684 | 3,407 | 3,234 | 44 | 1,094 | 2,114 |

[1] *Source: Derived from visitor spending estimates in NPS 2013b*

development of water-based access could be implemented. Over the long-term, in alternative 2 there would be potential for an adverse economic impact due to likely losses in economic activity to the region in the absence of access to the seashore.

Implementation of seashore operations management actions by NPS in alternative 2 affecting land use in the MD 611 corridor would have a negligible impact on the socio-economic environment. NPS would make additional investments in new facilities in the MD 611 corridor that would change the character near the existing seashore headquarters complex. The existing seashore headquarters complex would be demolished and replaced with a new structure at the same location. NPS would also acquire approximately 10 acres as close as possible to the entrance station for development of the mainland base of operation for the new visitor shuttle, including an entrance station and administrative office, visitor parking, and shuttle vehicle storage and maintenance area. These investments would likely occur on existing public land owned by the NPS or MD DNR with the impact confined to the MD 611 corridor near existing NPS and MD DNR operations facilities. These investments would not alter the character of the MD 611 corridor beyond the entrance station vicinity, which is already used to support seashore operations and visitor education, and would not induce new private development within the MD 611 corridor.

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have impacts on the socio-economic environment would be the same as those identified for alternative 1 (section 4.11.2).

The overall cumulative impacts on the socio-economic environment would be primarily adverse because contingency planning would continue to place the seashore at very high risk of losing access for months to years in the event that a catastrophic storm destroys transportation infrastructure that provides vehicular access to the island. Alternative 2 would add an appreciable increment to the overall adverse cumulative impact because contingency planning would continue to expose recreational uses throughout the seashore to high risk with the potential for abrupt and very long-term interruption or complete loss, with ensuing associated abrupt decline in visitor spending and loss of jobs, labor income, and value added to the local economy. There would also be beneficial cumulative impacts associated with management actions that would continue to ensure that visitors have opportunities for traditional activities and experiences at the seashore as long as there is vehicular access to the seashore. As long as there is vehicular access to the island, alternative 2 would add an appreciable increment to the beneficial impact associated with continued access to recreation experiences.

- **Conclusions**

In alternative 2 management actions would have both adverse and beneficial impacts on the socio-economic environment and would add an appreciable adverse increment and an apreciable beneficial increment (as long as vehicular access is possible) to the total cumulative impacts on the socio-economic environment, respectively.

The beneficial impact would be significant because management actions would continue to maintain existing levels of visitation with associated visitor spending, job generation, labor income, and value added to the local economy. As in alternative 1, when vehicular access to the seashore is lost, current management practices in alternative 2 would expose recreational uses throughout the seashore to high risk with the potential for abrupt and very long-term interruption or complete loss resulting in an adverse impact on the socio-economic environment. The adverse impacts on the socio-economic environment would be significant because when vehicular access is lost visitor spending would drop to approximately 5 percent of its previous levels, with similar drops in job generation, labor income, and value added to the local economy. There would be uncertainty as to when access would be restored via reconstructed transportation infrastructure and/or development of a water-based transportation system. There would also be uncertainty as to whether congressional or state funding would be appropriated for emergency repairs. The decline in visitation and associated visitor spending would be upsetting to local businesses that are dependent upon seashore visitors and local residents who are employed in the tourism industry.

Other management actions including development of new visitor use and seashore operations facilities potentially affecting gateway community land use in the MD 611 corridor would have a negligible impact on the socio-economic environment. As in

alternative 1, continuation of NPS's current role in local land preservation efforts would have a minor beneficial impact on the socio-economic environment.

### 4.11.5 ALTERNATIVE 3 – SUSTAINABLE RECREATION AND CLIMATE CHANGE ADAPTATION (NPS PREFERRED ALTERNATIVE)

- **Impact Analysis**

**Coastal Response Management Actions.** Contingency planning in alternative 3 would have a beneficial impact on the socio-economic environment by enabling relatively quick restoration of access to the island and potentially enabling visitation and associated visitor spending to return to previous levels within a few years (see seashore operations management actions).

**Natural Resource Management Actions**. Acquisition of 250 to 200 acres around each of two public access sites by the NPS or one of its conservation partners would have a beneficial impact on the socio-economic environment. Such land protection would further help to accomplish local land preservation goals as summarized above for land protection within the Chincoteague Bay and Newport Bay watersheds.

**Cultural Resource Management Actions.** Analysis of cultural resource management actions identified no associated impacts on the socio-economic environment.

**Visitor Use and Visitor Experience Management Actions.** Analysis of visitor use and visitor experience management actions identified no associated impacts on the socio-economic environment.

**Seashore Operations Management Actions.** As in alternatives 2 and 4, implementation of an alternative transportation system and fortification of the Maryland developed area would enable seashore visitation to continue to grow at the historic rate of one percent per year. Overall visitation and visitor spending associated with alternatives 2, 3, and 4 would have a beneficial economic impact on the region as long as vehicular access is maintained (see section 4.11.3).

In the future, once vehicular access is lost, seashore visitation would initially reduce dramatically. In alternative 3 (as in alternatives 1 and 2), only visitors arriving by boat would be able to visit the seashore in Maryland. However, unlike alternatives 1 and 2, in alternative 3 this dramatically reduced level of visitation would continue for one to two years while previously completed plans for development of water-based access to the seashore would be implemented. Once the ferry is operational and as visitors become familiar with its use, annual visitation levels would begin to increase. Availability of an island shuttle and other visitor service would increase the likelihood of visitation increasing to levels prior to loss of vehicular access. Overall, there would be a

**Table 4.3 Estimated Local-Level Impacts of NPS Visitor Spending on Local Economies – Alternative 3 (Maryland)**

| Year | GMP Management Context | Public Use | | Visitor Spending | | Impacts of Non-Local Visitor Spending | | |
|---|---|---|---|---|---|---|---|---|
| | | Recreation Visits (MD only) | Overnight Stays | All Visitors ($000s) | Non-Local Visitors ($000s) | Jobs | Labor Income ($000s) | Value Added ($000s) |
| 2023 | visitation trends and access continue from 2014 through 2023 | 908,807 | 33,675 | 68,148 | 64,686 | 882 | 21,883 | 42,271 |
| 2024 | vehicular access is lost (hypothetical) | 70,440 | 1,684 | 3,407 | 3,234 | 44 | 1,094 | 2,114 |
| 2029 | passenger ferry operational (starting in 2025) (hypothetical) | 524,844 | 18,521 | 37,481 | 35,577 | 485 | 12,036 | 23,249 |
| 2034 | passenger ferry operational (starting in 2025) (hypothetical) | 979,247 | 35,359 | 71,556 | 67,920 | 926 | 22,977 | 44,384 |

[1] *Source: Derived from visitor spending estimates in NPS 2013b*

beneficial impact on visitor use and visitor experience because visitors who previously arrived by vehicle would once again be able to get to the seashore.

Projections for such an outcome – assumed for hypothetical purposes in 2024 – indicate that as in alternatives 2 and 4 annual recreation visits could drop to under 70,000. Visitors spending (non-local and local) would drop to approximately $3.4 million annually, representing only five percent of prior year visitor spending (table 4.3). Non-local visitor spending annually would generate only approximately 44 jobs, $1.1 million in labor income, and $2.1 million in value added. Unlike alternative 2, in alternative 3 this dramatically reduced level of visitor spending and the associated beneficial economic impacts would continue for only one year while previously completed plans for development of water-based access would be implemented. Plans for replacing other visitor use facilities on the mainland would also be implemented immediately. Assuming that 10 percent of visitors return to the seashore annually once a ferry is operating, within five years (by 2029) visitation levels would return to slightly more than half of their 2023 level before access was lost. At this rate of visitor return – and assuming the ferry operation and island-based shuttle system are designed with adequate capacity – visitation could regain the 2022 level after ten years (by 2034).

Overall visitation and visitor spending associated with alternative 3 would have a beneficial economic impact on the region while vehicular access is maintained, as in alternatives 2 and 4. After vehicular access is lost, alternative 3 would continue to have a beneficial economic impact by quickly restoring access and potentially enabling

visitation and associated visitor spending to return to previous levels within a few years. Additionally, there would likely be an increase in visitors who prefer primitive, backcountry experiences; these visitors would utilize local services for boat or canoe rentals and guides, as well as spend for other commercial services during their visit tothe area, compensating slightly for revenue lost from traditional beach and camping visitation and resulting in a beneficial economic impact.

Implementation of seashore operations management actions by NPS in alternative 3 affecting land use  NPS would make additional investments in new facilities in the MD 611 corridor that would change the character of the area near the existing seashore headquarters complex.  The existing seashore headquarters complex would be demolished and the site reused for development of the mainland base of operation for the new visitor shuttle, including an entrance station and administrative office, visitor parking, and shuttle vehicle storage and maintenance area.  These investments would occur on existing public land owned by the NPS, with the impact confined to the MD 611 corridor very near the Verrazano Bridge where NPS and MD DNR functions are currently based.  These investments would not alter the character of the MD 611 corridor beyond the entrance station vicinity, which is already used to support seashore operations and visitor education, and would not induce new private development within the MD 611 corridor.  Overall, implementation of these management actions near the existing seashore headquarters complex by NPS in alternative 3 affecting land use in the MD 611 corridor would have a negligible impact on the socio-economic environment.

The NPS would relocate the seashore headquarters complex to a new site in the MD 611 corridor, as close as possible to the existing headquarters complex (final decision dependent upon outcome of value analysis).  The new complex would likely be located on land now owned by MD DNR and co-located with new Assateague State Park facilities.  These investments would alter the scenic character of the MD 611 corridor near the development site but would not induce new private development within the MD 611 corridor.  Because of these actions, there would be a minor adverse impact on the socio-economic environment.

The NPS would possibly develop a new campground on the mainland after consultation with Assateague State Park.  This campground would be built to replace existing campsites on Assateague Island that have been lost, or are in imminent danger of being lost, due to the effects of catastrophic storms and/or climate change/sea level rise.  The site would likely be on existing public land owned by MD DNR, but could be elsewhere in the MD 611 corridor south of MD 376.  This investment would alter the scenic character of the MD 611 corridor by converting currently rural agricultural or forested land to a developed campground use.  There would be only slight potential to induce new private commercial development in the corridor because the action would be replacement (not expansion) of existing campsites that are already served by existing commercial

development. Because of these actions affecting land use in the MD 611 corridor, there would be a minor adverse impact on the socio-economic environment.

When vehicular access to the seashore is lost, the NPS would implement plans for an expanded alternative transportation system (including development of a ferry terminal facility and ferry terminal building) and for water-based seashore operations (including development of a mainland docking facility and storage area). The site for these facilities would likely be on Sinepuxent Bay, either through an expansion of the existing MD DNR public access site near the Verrazano Bridge or on private land to be acquired somewhere in the MD 611 corridor. Prospective sites would be identified and evaluated through a future implementation planning/NEPA compliance process by the NPS. In general, it can be assumed that development of water-based access facilities would alter the scenic character of the MD 611 corridor by converting currently rural agricultural or forested land and the shoreline area at the development site to transportation and operations uses (for roads, parking, docking facilities, storage/maintenance area, and office). There would be only slight potential to induce new private commercial development in the corridor because the number of visitors to the seashore using the new facilities would initially be lower than it is today and would not return to current levels for several years following the commencement of water-based operations. Assuming a site located off MD 611, existing traffic volumes in the MD 611 corridor would initially decline and then slowly return to existing levels. Because of these actions affecting land use in the MD 611 corridor, there would be a minor adverse impact on the socio-economic environment.

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have impacts on the socio-economic environment would be the same as those identified for alternative 1 (section 4.11.2).

The overall cumulative impacts on the socio-economic environment would be primarily beneficial because contingency planning by the NPS would enable relatively quick restoration of access to the seashore following the loss of vehicular access. Alternative 3 would add an appreciable increment to the overall adverse cumulative impact because contingency planning for a water-based alternative transportation system for visitor access (passenger ferry) and for seashore operations would fairly quickly restore access to the island. When access is lost there would be an abrupt decline in visitor spending and loss of jobs, labor income, and value added to the local economy; this decline would be relatively short term when compared to alternatives 1 and 2. There would also be adverse cumulative impacts associated with loss of visitor spending, jobs, labor income, and value added to the local economy during time it takes to restore access to the island. During the time it takes to restore access, alternative 3 would add an appreciable increment to the adverse impact associated with continued access to recreation experiences.

- **Conclusions**

In alternative 3 management actions would have both adverse and beneficial impacts on the socio-economic environment and would add an appreciable adverse increment (significantly shorter duration than in alternatives 1 and 2) and an appreciable beneficial increment to the total cumulative impacts on the socio-economic environment, respectively.

As in alternatives 2 and 4, as long as there is vehicular access (with a shuttle option) to the seashore, management actions would ensure that visitors have opportunities for traditional activities and experiences at the seashore, resulting in a beneficial impact on the socio-economic environment. The beneficial impact would be significant because management actions would continue to maintain existing levels of visitation with associated visitor spending, job generation, labor income, and value added to the local economy.

When vehicular access to the seashore is lost, contingency planning in alternative 3 would have a beneficial impact on the socio-economic environment. The beneficial impacts on the socio-economic environment would be significant. Although visitor spending would initially drop to approximately 5 percent of its previous levels as in alternatives 1, 2, and 4 (with similar drops in job generation, labor income, and value added to the local economy), this dramatically reduced level of visitor spending and the associated adverse economic impacts would continue for only one year while previously completed plans for development of water-based access would be implemented. Within a few years of losing access visitation levels would return to or near levels when vehicular access was possible. While there would still be uncertainty as to when vehicular access would be lost, there would be certainty as to how long it would take to restore access via development of a water-based transportation system. Loss of access to the island – along with the loss of visitors and visitor spending – would be less upsetting to local businesses and residents relying on employment generated by visitor spending because there would be a plan in place to restore seashore access to visitors.

Increased visitation to the backcounty and associated spending would compensate slightly for revenue lost from traditional beach and camping visitation, resulting in a beneficial economic impact.

Other management actions including development of new visitor use and seashore operations facilities potentially affecting gateway community land use in the MD 611 corridor would have negligible to moderate adverse impacts on the socio-economic environment that would not be significant.

### 4.11.6 ALTERNATIVE 4 – NATURAL ISLAND EVOLUTION AND A PRIMITIVE ISLAND EXPERIENCE

- **Impact Analysis**

**Coastal Response Management Actions.** Contingency planning in alternative 4 would have a beneficial impact on the socio-economic environment by enabling relatively quick restoration of access to the island and potentially enabling visitation and associated visitor spending to resume, although at a level slightly more than half of that prior to the loss of access (see seashore operations management actions).

**Natural Resource Management Actions**. Analysis of cultural resource management actions identified no associated impacts on the socio-economic environment.

**Cultural Resource Management Actions.** Analysis of cultural resource management actions identified no associated impacts on the socio-economic environment.

**Visitor Use and Visitor Experience Management Actions.** Analysis of visitor use and visitor experience management actions identified no associated impacts on the socio-economic environment.

**Seashore Operations Management Actions.** As in alternatives 2 and 3, implementation of an alternative transportation system and fortification of the Maryland developed area would enable seashore visitation to continue to grow at the historic rate of one percent per year. Overall visitation and visitor spending associated with alternatives 2, 3, and 4 would have a beneficial economic impact on the region as long as vehicular access is maintained (see section 4.11.3).

In the future, once vehicular access is lost, seashore visitation would initially reduce dramatically. In alternative 4 (as in alternatives 1, 2 and 3), only visitors arriving by boat would be able to visit the seashore in Maryland. However, unlike alternatives 1 and 2, in alternative 4 as in alternative 3, this dramatically reduced level of visitation would continue for one to two years while previously completed plans for development of water-based access to the seashore would be implemented. Once the ferry is operational and as visitors become familiar with its use, annual visitation levels would begin to increase. Unlike alternative 3, lack of an island shuttle and reduced level of visitor services would likely deter some visitors, inhibiting return to visitation levels prior to loss of vehicular access. However, overall there would be a beneficial impact on visitor use and visitor experience because visitors who previously arrived by vehicle would once again be able to get to the seashore.

Projections for such an outcome – assumed for hypothetical purposes in 2024 – indicate that as in alternatives 2 and 3 annual recreation visits could drop to 70,000. Visitors spending (non-local and local) would drop to approximately $8.4 million annually,

**Table 4.4 Estimated Local-Level Impacts of NPS Visitor Spending on Local Economies – Alternative 4 (Maryland)**

| Year | GMP Management Context | Public Use | | Visitor Spending | | Impacts of Non-Local Visitor Spending | | |
|---|---|---|---|---|---|---|---|---|
| | | Recreation Visits (MD only) | Overnight Stays | All Visitors ($000s) | Non-Local Visitors ($000s) | Jobs | Labor Income ($000s) | Value Added ($000s) |
| 2023 | visitation trends and access continue from 2014 through 2023 | 908,807 | 33,675 | 68,148 | 64,686 | 882 | 21,883 | 42,271 |
| 2024 | vehicular access is lost (hypothetical) | 70,440 | 1,684 | 3,407 | 3,234 | 44 | 1,094 | 2,114 |
| 2029 | passenger ferry operational (starting in 2025) (hypothetical) | 297,642 | 10,102 | 20,444 | 19,406 | 265 | 6,565 | 12,681 |
| 2034 | passenger ferry operational (starting in 2025) (hypothetical) | 524,844 | 18,521 | 37,481 | 35,577 | 485 | 12,036 | 23,249 |

[1] *Source: Derived from visitor spending estimates in NPS 2013b*

representing only five percent of prior year visitor spending (table 4.4). Non-local visitor spending annually would generate only approximately 44 jobs, $1.1 million in labor income, and $2.1 million in value added. Unlike alternative 2, in alternative 3 this dramatically reduced level of visitor spending and the associated beneficial economic impacts would continue for only one year while previously completed plans for development of water-based access would be implemented. Plans for replacing other visitor use facilities on the mainland would also be implemented immediately. Assuming that 5 percent of visitors return to the seashore annually once a ferry is operating, within five years (by 2029) visitation levels would return to slightly more than a quarter of their 2023 level before access was lost. At this rate of visitor return – and assuming the ferry operation and island-based shuttle system are designed with adequate capacity – visitation could regain one-half of the 2022 level after ten years (by 2034). Visitation would be lower than in alternative 3 because of the lack of an island shuttle and the limited day-use and primitive camping opportunities for visitors.

Overall visitation and visitor spending associated with alternative 4 would have a beneficial economic impact on the region while vehicular access is maintained, as in alternatives 2 and 3. After vehicular access is lost, alternative 4 would continue to have a beneficial economic impact by quickly restoring access and potentially enabling visitation and associated visitor spending to resume, although at a level slightly more than half of that prior to the loss of access. As in alternative 3, there would also likely be an increase in visitors who prefer primitive, backcountry experiences; these visitors would utilize local services for boat or canoe rentals and guides, as well as spend for

other commercial services during their visit to the area, compensating slightly for revenue lost from traditional beach and camping visitation and resulting in a beneficial economic impact.

As in alternative 3, NPS would make additional investments in new facilities in the MD 611 corridor that would change the character of the area near the existing seashore headquarters complex (see section 4.11.5). Because of these actions, implementation of management actions near the existing seashore headquarters complex by NPS in alternative 3 affecting land use in the MD 611 corridor would have a negligible impact on the socio-economic environment.

As in alternative 3, in alternative 4 the NPS would relocate the seashore headquarters complex to a new site in the MD 611 corridor, as close as possible to the existing headquarters complex (final decision dependent upon outcome of value analysis) (see section 4.11.5). Because of these actions affecting land use in the MD 611 corridor, there would be a minor adverse impact on the socio-economic environment.

As in alternative 3, in alternative 4 when vehicular access to the seashore is lost, the NPS would implement plans for an expanded alternative transportation system (including development of a ferry terminal facility and ferry terminal building) and for water-based seashore operations (including development of a mainland docking facility and storage area) (see section 4.11.5). Unlike alternative 3, visitor levels would likely not return to existing levels in alternative 4, suggesting that the facility could be smaller and would likely result in reduced traffic volumes in the MD 611 corridor. Because of these actions affecting land use in the MD 611 corridor, there would be a moderate adverse impact on the socio-economic environment.

- **Cumulative Impacts**

Other past, present, and reasonably foreseeable actions that have had or would have impacts on the socio-economic environment would be the same as those identified for alternative 1 (section 4.11.2).

The overall cumulative impacts on the socio-economic environment would be primarily beneficial because contingency planning by the NPS would enable relatively quick restoration of access to the seashore following the loss of vehicular access. Alternative 4 would add an appreciable increment to the overall adverse cumulative impact because contingency planning for a water-based alternative transportation system for visitor access (passenger ferry) and for seashore operations would fairly quickly restore access to the island. When access is lost there would be an abrupt decline in visitor spending and loss of jobs, labor income, and value added to the local economy; this decline would be relatively short term when compared to alternatives 1 and 2. There would also be adverse cumulative impacts associated with loss of visitor spending, jobs, labor income, and value added to the local economy during time it takes to restore

access to the island. During the time it takes to restore access, alternative 4 would add an appreciable increment to the adverse impact associated with continued access to recreation experiences.

- **Conclusions**

In alternative 4 management actions would have both adverse and beneficial impacts on the socio-economic environment and would add an appreciable adverse increment (significantly shorter duration than in alternatives 1 and 2) and an appreciable beneficial increment to the total cumulative impacts on the socio-economic environment, respectively.

As in alternatives 2 and 3, as long as there is vehicular access (with a shuttle option) to the seashore, management actions would ensure that visitors have opportunities for traditional activities and experiences at the seashore, resulting in a beneficial impact on the socio-economic environment. The beneficial impact would be significant because management actions would continue to maintain existing levels of visitation with associated visitor spending, job generation, labor income, and value added to the local economy.

When vehicular access to the seashore is lost, contingency planning in alternative 4 would have a beneficial impact on the socio-economic environment. The beneficial impacts on the socio-economic environment would be significant. Although visitor spending would initially drop to approximately 5 percent of its previous levels as in alternatives 1, 2, and 3 (with similar drops in job generation, labor income, and value added to the local economy), this dramatically reduced level of visitor spending and the associated adverse economic impacts would continue for only one year while previously completed plans for development of water-based access would be implemented. Within a few years of losing access, visitation levels would return to approximately half of visitation levels when vehicular access was possible. While there would still be uncertainty as to when vehicular access would be lost, there would be certainty as to how long it would take to restore access via development of a water-based transportation system. Loss of access to the island – along with the loss of visitors and visitor spending – would be less disappointing to local businesses and residents relying on employment generated by visitor spending because there would be a plan in place to restore seashore access to visitors.

Increased visitation to the backcounty and associated spending would compensate slightly for revenue lost from traditional beach and camping visitation, resulting in a beneficial economic impact.

Other management actions including development of new seashore operations facilities potentially affecting gateway community land use in the MD 611 corridor would have

negligible to moderate adverse impacts on the socio-economic environment that would not be significant.

## 4.12 Relationship between Local Short-term Uses of the Environment and Maintenance and Enhancement of Long-term Productivity

In all of the alternatives, the NPS would continue to manage the seashore to maintain ecological processes and native and biological communities, and to provide for appropriate recreational activities consistent with the preservation of natural and cultural resources. Previously disturbed areas would be restored to return them to productivity, as funding permits. Any actions the NPS takes in the seashore would be taken with consideration to ensure that uses do not adversely affect the productivity of biotic communities. Disturbance of the seashores's soils, water quality, vegetation, and wildlife, due to visitor use and the construction of new facilities would reduce the long-term productivity of the seashore in localized areas; however, overall there would likely be only a small effect on the seashore's long-term productivity.

## 4.13 Irreversible or Irretrievable Commitments of Resources

Irreversible commitments of resources are actions that result in the loss of resources that cannot be reversed. Irretrievable commitments are actions that result in the loss of resources but only for a limited period of time.

### 4.13.1 ALTERNATIVE 1

Under alternative 1, no action would be taken because of this alternative that would result in consumption of nonrenewable natural resources or in use of renewable resources that would preclude other uses for a period of time. There would be no irreversible or irretrievable commitments of natural resources in the seashore by the NPS.

No actions would be taken that would result in irreversible or irretrievable effects on historic properties. The seashore wouldcontinue to conduct appropriate cultural resource management in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (NPS 1995c) and *NPS Management Policies* (NPS 2006c).

### 4.13.2 ALTERNATIVE 2

Under alternative 2, no action would be taken because of this alternative that would result in consumption of nonrenewable natural resources or in use of renewable resources that would preclude other uses for a period of time. There would be no irreversible or irretrievable commitments of natural resources in the seashore by the NPS.

No actions would be taken that would result in irreversible or irretrievable effects on historic properties. The seashore wouldcontinue to conduct appropriate cultural resource management in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (NPS 1995c) and *NPS Management Policies* (NPS 2006c).

#### 4.13.3 ALTERNATIVE 3 (NPS PREFERRED ALTERNATIVE)

Under alternative 3, no action would be taken because of this alternative that would result in consumption of nonrenewable natural resources or in use of renewable resources that would preclude other uses for a period of time. There would be no irreversible or irretrievable commitments of natural resources in the seashore by the NPS.

No actions would be taken that would result in irreversible or irretrievable effects on historic properties. The seashore wouldcontinue to conduct appropriate cultural resource management in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (NPS 1995c) and *NPS Management Policies* (NPS 2006c).

#### 4.13.4 ALTERNATIVE 4

Under alternative 4, no action would be taken because of this alternative that would result in consumption of nonrenewable natural resources or in use of renewable resources that would preclude other uses for a period of time. There would be no irreversible or irretrievable commitments of natural resources in the seashore by the NPS.

No actions would be taken that would result in irreversible or irretrievable effects on historic properties. The seashore wouldcontinue to conduct appropriate cultural resource management in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (NPS 1995c) and *NPS Management Policies* (NPS 2006c).

## 4.14 Adverse Impacts that could not be Avoided

Unavoidable adverse impacts are defined as moderate to major impacts that cannot be fully mitigated or avoided.

#### 4.14.1 ALTERNATIVE 1

In alternative 1 (continuation of current management), existing conditions may have resulted in unavoidable adverse impacts. The location of seashore facilities on Assateague Island and on the Maryland mainland would continue to impact the floodplain, as all of the land on the island and most of the land on the mainland within

the seashore boundary is within the 100-year floodplain. Cultural resources would continue to be exposed to unavoidable adverse impacts associated with coastal processes and the effects of climate change/sea level rise.

### 4.14.2 ALTERNATIVE 2

In alternative 2, facilities would be concentrated within a fortified area on the island and new mainland facilities, including a new entrance station and ATS parking facility, would be constructed within the 100-year floodplain because no alternative sites would be available that are outside the floodplain. Once the land area within the developed area can no longer be fortified or is lost, most permanent visitor facilities would likely be removed from the island floodplain. Cultural resources would continue to be exposed to unavoidable adverse impacts associated with natural coastal processes and the effects of climate change/sea level rise.

### 4.14.3 ALTERNATIVE 3 (NPS PREFERRED ALTERNATIVE)

In alternative 3, damaged or lost facilities would be relocated to more sustainable locations on the island, but would still be located within the 100-year floodplain because the entire island is within the floodplain. New mainland facilities, inluding a new entrance station and ATS parking facility, would be constructed within the 100-year floodplain because no suitable alternative sites would be available. Once vehicular access to the island is lost, most permanent developed visitor facilities would be relocated to the mainland and new facilities needed to support water-based visitor access and seashore operations would be developed on the mainland and the island. Some new facilities would be located within the 100-year floodplain because they are water dependent or no suitable alternative sites would be available that are outside the floodplain. To the maximum extent possible, site selection for replacement facilities that are not water dependent would seek to locate them above the 100-year floodplain on the mainland. Cultural resources would continue to be exposed to unavoidable adverse impacts associated with natural coastal processes and the effects of climate change/sea level rise.

### 4.14.4 ALTERNATIVE 4

In alternative 4, damaged or lost facilities would not be replaced, thus eliminating structures and uses from the 100-year floodplain. New mainland facilities, including a new entrance station and ATS parking facility, would be constructed within the 100-year floodplain because no suitable alternative sites would be available. Once vehicular access to the island is lost, new facilities needed to support water-based visitor access and seashore operations would be developed within the 100-year floodplain on the mainland and the island. These facilities would be located within the 100-year floodplain because they are water dependent. Cultural resources would continue to be exposed to unavoidable adverse impacts associated with natural coastal processes and the effects of climate change/sea level rise.

CHAPTER 5

# CONSULTATION AND COORDINATION


**5.1** Public Involvement and Agency Coordination ..... 5-1
**5.2** Section 106 Consultation ..... 5-6
**5.3** Section 7 Consultation ..... 5-7
**5.4** Consultation with State Natural Resource Management Agencies ..... 5-8
**5.5** Coastal Zone Management Act/Federal Consistency ..... 5-8
**5.6** Tribal Coordination ..... 5-9
**5.7** Draft GMP/EIS Document Review ..... 5-9
**5.8** List of Preparers ..... 5-10
**5.9** List of Draft GMP/EIS Recipients ..... 5-12

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# 5. CONSULTATION AND COORDINATION

## 5.1 Public Involvement and Agency Coordination

Since beginning the GMP planning process in the summer of 2009, the NPS has reached out to the public on an ongoing basis for input regarding seashore management issues, the range of management alternatives, and the types of impacts to be addressed in the seashore's GMP. This process – referred to as scoping – has occurred internally with NPS planning teams and externally with federal, state, and local governments, other interested parties, and the general public.

A public involvement plan guided the scoping process, outlining a program of continuous and dynamic public engagement on many levels during development of the GMP. In support of the public involvement process, the seashore developed a preliminary list of stakeholders and a mailing list of potentially interested individuals and organizations.

NPS published a notice of intent in the Federal Register at the beginning of the scoping process (July 2009) inviting public comment and participation in the planning process. Ensuing scoping activities during development of the plan included the following:

- **News Releases and Media Coverage.** The first GMP/EIS news release occurred in September 2009 announcing a series of open house workshops and availability of the first GMP newsletter.

  The seashore issued a second news release to its standard media contacts on August 2, 2011, announcing the preliminary management alternative concepts public workshops and availability of the second GMP newsletter. This release also described the planning process and invited the public to review and comment on the preliminary alternatives. The news release generated a number of news articles which appeared in both traditional and electronic news media during the following days and weeks.

  On September 13, 2011, a third press release announced that the public comment period on the preliminary alternatives had been extended an additional two weeks.

- **Seashore Web Site.** Prior to issuing both scoping and preliminary alternatives news releases, the seashore posted information on its web site describing the planning process, the upcoming public workshops, and how to obtain and comment on the newsletters. Links provided the public an opportunity to visit the GMP pages on the NPS Planning, Environment and Public Comment (PEPC) web site where additional information and documents were available.

**Table 5.1 Summary of Public Involvement and Agency Coordination**

| Planning Phase | Date | Consultation or Public Involvement Activity |
|---|---|---|
| Initial Project Scoping | December 18-19, 2007 | Joint Planning Meeting, NPS and FWS |
| | spring/summer 2009 | Worcester County Commission |
| | spring/summer 2009 | Ocean City Town Council |
| | spring/summer 2009 | Berlin Town Council |
| | spring/summer 2009 | Chincoteague Town Council |
| | spring/summer 2009 | staff for Maryland Senator Mikulski |
| | spring/summer 2009 | staff for Maryland Senator Cardin |
| | spring/summer 2009 | staff for Maryland Congressman Kratovil |
| | spring/summer 2009 | Maryland State Senator Stolzfus |
| | spring/summer 2009 | Maryland State Delegate Conway |
| | spring/summer 2009 | Maryland State Delegate Mathias |
| | spring/summer 2009 | staff for Virginia Congressman Nye |
| | spring/summer 2009 | civic leaders, key stakeholders, constituents |
| | July 2009 | public notice of intent (NOI) in the *Federal Register* |
| | July 11, 2009 | outdoor public scoping in Maryland (Old Ferry Landing and North Beach Parking Lot) |
| | July 11, 2009 | outdoor public scoping in Virginia (Toms Cove Visitor Center and Toms Cove Parking Lot) |
| | August 15, 2009 | outdoor public scoping in Maryland (OSV Entrance Road and North Beach Parking Lot) |
| | August 15, 2009 | outdoor public scoping in Virginia (Toms Cove Visitor Center and Toms Cove Parking Lot) |
| | August 20 2009 – December 30, 2009 | public comment period on Newsletter 1 – GMP/EIS Scoping |
| | September 21, 2009 | public workshop – scoping (Wor-Wic Community College, Salisbury, MD) |
| | September 22, 2009 | public workshop – scoping (Paul Sarbanes Coastal Ecology Center, Berlin, MD) |
| | September 23, 2009 | public workshop – scoping (Chincoteague Community Center, Chincoteague, VA) |
| Agency Scoping Letters | June 21, 2010 | Federal Consistency Coordinator, Wetlands and Waterways Program, Maryland Department of the Environment |
| | June 21, 2010 | Office of Preservation Services, Division of Historical and Cultural Programs, Department of Housing and Community Development |
| | June 21, 2010 | Assistant Regional Administrator, Protected Resources Division, NOAA Fisheries Service |
| | June 21, 2010 | Field Supervisor, Chesapeake Bay Field Office, U.S. Fish and Wildlife Service |
| | June 21, 2010 | Field Supervisor, Virginia Field Office, U.S. Fish and Wildlife Service |
| | June 21, 2010 | Virginia Council on Indians, Office of the Governor |
| | June 21, 2010 | Program Manager, Office of Environmental Impact Review, Virginia Department of Environmental Quality |
| | June 21, 2010 | Associate Director, Natural Heritage Program, Maryland Department of Natural Resources, Wildlife and Heritage Service |
| | June 21, 2010 | Virginia Department of Conservation and Recreation, Division of Natural Heritage |

**Table 5.1 (cont.) Summary of Public Involvement and Agency Coordination**

| Planning Phase | Date | Consultation or Public Involvement Activity |
|---|---|---|
| | June 21, 2010 | Virginia Department of Game and Inland Fisheries, Environmental Services Section |
| | June 21, 2010 | Senior Policy Analyst, Division of Resources Services and Review, Virginia Department of Natural Resources |
| | August 25, 2010 | CNWR CCP scoping workshop |
| | September 21, 2010 | CNWR CCP scoping workshop |
| | November 2010 | briefing for NPS Northeast Region directorate |
| | December 6, 2010 | Assateague State Park and MD Department of Natural Resources – Maryland Park Service |
| Preliminary Alternatives | February 4, 2011 | Maryland Department of Natural Resources – Maryland Fisheries Service |
| | March 8, 2011 | Virginia Marine Resources Commission |
| | May 4, 2011 | seashore briefing, site visit, and meeting with representatives from NPS Wilderness Program |
| | March 2011 | briefing for NPS Washington Office |
| | May 2011 | seashore visit and briefing for NPS Washington Office |
| | July 2011 | written briefings and copies of the preliminary alternatives newsletter to the congressional delegations and state and local legislators for both Maryland and Virginia:<br>– Congressman Andy Harris (MD) – oral briefing<br>– Congressman Scott Rigell (VA) – oral briefing<br>– staff to Senator Mikulski (MD) – oral briefing<br>– staff to Senator Cardin (MD) – oral briefing<br>– staff to Senator Webb (VA) – oral briefing<br>– staff to Senator Warner (VA) – oral briefing<br>– Chincoteague Town Council – oral briefing<br>– Accomack County Board of Supervisors – oral briefing |
| | July 20, 2011 – October 1, 2011 | public comment period on Newsletter 2 – Preliminary Alternatives |
| | August 16, 2011 | public workshop – Preliminary Alternatives (Wor-Wic Community College, Salisbury, MD) |
| | August 17, 2011 | public workshop – Preliminary Alternatives (Marine Science Consortium, Wallops Island, VA) |
| | August 18, 2011 | public workshop – Preliminary Alternatives (Ocean Pines Library, Ocean Pines, MD) |
| | August 22, 2011 | CNWR CCP public meeting |
| | December 14, 2011 | Assateague State Park and Maryland Department of Natural Resources – Maryland Park Service |
| Final Alternatives | April 4, 2012 | briefing for staff members of the Maryland delegation (Cardin, Mikulski, and Harris) |
| | November, 2012 | briefing for the NPS Washington Office |
| | February, 2013 | briefing for the DOI, FWS and NPS Directorate regarding the CNWR CCP and the GMP/EIS |
| | November, 2014 | briefing for the NPS Washington Office |

- **NPS PEPC Web Site.** NPS updated the NPS PEPC web site periodically during the planning process, posting newsletters, public open house workshops announcements, updates on the status of planning, scoping comments, and background documents.
- **Distribution of GMP/EIS Newsletters.** The first newsletter was issued in summer 2009 and described the seashore's planning process. It was distributed to more than 2,500 individuals, agencies, and organizations via the seashore's mailing list and hand distribution at ranger stations and open house workshops. An email message was sent to additional individuals announcing the newsletter's availability and providing a link to the PEPC site. The newsletter invited the public to provide ideas and comments for the planning process, and posed a series of scoping questions.

  The first GMP/EIS newsletter was open for public comment from August 20, 2009 to December 30, 2009. The public provided comments in various forms, including comment cards (139), emails (44), letters (4), PEPC comments (18), comments written on park maps (32), and comments recorded at outdoor events (44).

  In 2011 copies of the second GMP/EIS newsletter that outlined the preliminary alternative concepts were distributed to more than 500 individuals, agencies, and organizations on the seashore's mailing list. An email message was sent to additional individuals announcing the newsletter's availability and providing a link to the PEPC site. At and following the public meetings, approximately 950 copies of the newsletter were distributed to the general public at the seashore's two visitor centers and ranger station.

  The public comment period for the preliminary alternative concepts extended from July 20, 2011 to October 1, 2011. The public provided comments via comment cards (10), the PEPC website (155), emails (159), and letters (19).

- **Preliminary Management Alternatives Postcard.** The NPS sent more than 500 postcards to the seashore's mailing list in November 2010. The postcard served as an update from the planning team regarding the development of preliminary management alternatives.
- **GMP/EIS Public Workshops.** In 2009 NPS hosted a series of scoping open house workshops and outdoor information stations as follows:
  - July 11, 2009 – Old Ferry Landing, the North Beach Parking Lot, Toms Cove Visitor Center, and the Toms Cove Parking Lot
  - August 15, 2009 in Maryland – OSV Entrance Road, the North Beach Parking Lot, Toms Cove Visitor Center, and the Toms Cove Parking Lot

Initial scoping open house workshops occurred as follows:

- September 21, 2009 – Wor-Wic Community College
- September 22, 2009 – Paul Sarbanes Coastal Ecology Center
- September 23, 2009 – Chincoteague Center Community Center

In 2011 the seashore hosted three public workshops presenting the preliminary management alternatives, as follows:

- August 16, 2011 – Wor-Wic *Community College, Salisbury, Maryland*
- August 17, 2011 – Marine Science Consortium, Wallops Island, Virginia
- August 18th, 2011 – Ocean Pines Library, Ocean Pines, Maryland

The workshops provided general information about the planning process, summaries of major planning issues at the seashore, detailed information about the preliminary alternatives, and next steps. The public was invited to provide written comments and provided with information about the multiple ways to do so. The 2011 workshops were attended by approximately 112 individuals.

Seashore staff also participated in public workshops held in 2010 and 2011 by the FWS related to the Comprehensive Conservation Plan (CCP) for Chincoteague National Wildlife Refuge where related aspects of the seashore's GMP/EIS were discussed.

- **Briefings for Federal, State, and Local Elected Officials.** In 2009 during initial scoping, the seashore provided GMP/EIS briefings to staff to Senators Mikulski and Cardin (MD), staff to Congressmen Kratovil (MD) and Nye (VA), Maryland State Senator Stolzfus, Maryland State Delegates Conway and Mathias, and members of the Worcester County Commission, Ocean City Town Council, Berlin Town Council, and Chincoteague Town Council.

  In 2011, the seashore provided written briefings and copies of the preliminary alternatives newsletter to the congressional delegations and state and local legislators for both Maryland and Virginia. Oral briefings were provided to Congressman Andy Harris (MD), Congressman Scott Rigell (VA), and staff to Senators Mikulski (MD), Cardin (MD), Warner (VA), and Webb (VA). Members of the Chincoteague Town Council and Accomack County Board of Supervisors also received oral briefings.

  In the spring of 2012, the seashore briefed staff members of the Maryland delegation (Cardin, Mikulski, and Harris) on the planning process, preliminary alternatives, and public comments received on the alternatives.

- **Meetings with State Agencies.** In 2009, the seashore met with staff of Assateague State Park to explain the planning process and identify

opportunities for participation. In 2010, representatives of the state park and the Maryland Park Service were briefed on the status of planning, and the results of climate change scenario planning and other potential issues of mutual concern.

In 2011, seashore staff met with representatives of the MD Department of Natural Resources Fisheries Service and again with Assateague State Park and the Maryland Park Service to discuss the planning process and aspects of the preliminary alternatives with potential ramifications for those agencies. Similarly, staff met with representatives of the Virginia Marine Resource Commission to discuss the GMP/EIS's implications for commercial fisheries within the seashore.

- **Meetings with Civic Leaders and Constituent Groups.** In 2009, the seashore briefed a number of individuals and organizations with potential interest in the GMP/EIS to explain the planning process and encourage their participation in scoping activities.

  Throughout the preliminary alternatives comment period in 2011, seashore staff again met or spoke with civic leaders, constituent groups, key stakeholders and other interested parties. These included, but were not limited to: Chincoteague Community Leaders, The Nature Conservancy, Assateague Island Alliance, Maryland Coastal Bays Program, Assateague Mobile Sportfishermen's Association, Lower Shore Land Trust, Ocean Pines Anglers Club, commercial fishermen, and representatives of the seafood processing industry.

## 5.2 Section 106 Consultation

Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended, requires federal agencies to consider the effect of undertakings on properties listed on the *National Register of Historic Places* and to consult with the State Historic Preservation Officer (SHPO), the Advisory Council on Historic Preservation (ACHP), and certified local governments in the project area regarding the potential for effects on cultural resources. The 2008 Programmatic Agreement among NPS, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers describes how the NPS will carry out its section 106 responsibilities with respect to managing units of the national park system; establishes a process for complying with Section 106 and provides a streamlined review process in specific circumstances.

The general nature of the management objectives and potential actions in the GMP necessitates that the analysis of impacts to cultural resources and related Section 106 consultation be general and programmatic. In the future, section 106 consultation will occur as part of planning that "tiers" from the approved GMP/EIS during development

of program management plans and during design and construction of specific projects of the types identified in the approved GMP/EIS, if and when project funding becomes available. The general types of projects that could require consultation in the future include:

- construction of new facilities
- construction/installation of new utility systems and other infrastructure
- construction of new roads, parking lots, and trails
- restoration or rehabilitation of historic structures
- ground disturbing activities in areas without a history of previous site disturbance
- changes in management of cultural resources
- surveys or studies to identify presently unknown cultural resources
- all other actions with potential to affect cultural resources

On June 21, 2010, the NPS sent letters to the Maryland Office of Preservation Services Natural Heritage Program and the Virginia Department of Historic Resources for consultation purposes. Maryland Historical Trust responded on July 7, 2010 (see appendix C) expressing willingness to further consult with the NPS during the GMP/EIS planning process regarding cultural resource management at the seashore and section 106 compliance. The Virginia Department of Historic Resources verbally expressed their willingness to consult further with the NPS during the GMP/EIS planning process.

Consultation with the Maryland and Virginia SHPOs will occur during review of the Draft GMP/EIS. Each SHPO will receive a copy of the plan. Following review of the Draft GMP/EIS, additional conversations with the SHPOs will occur to address their comments. Following approval of the GMP/EIS, the NPS will consult with the SHPOs in accordance with the requirements of NHPA section 106.

## 5.3 Section 7 Consultation

Section 7 of the Endangered Species Act of 1973, as amended (16 USC 1531 et seq.) requires all federal agencies to consult with the FWS to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of listed species or critical habitat. NPS management policies also require cooperation with appropriate state conservation agencies to protect state-listed and candidate species of special concern.

On June 21, 2010, the NPS sent letters to the FWS Chesapeake Bay Field Office and the Virginia Field Office of the FWS for consultation purposes. The FWS Chesapeake Bay Field Office responded on July 30, 2010 (see appendix C), identifying federally listed

threatened and endangered species known to occur in the planning area and advising that potential impacts to those species and their habitats be analyzed as part of the GMP impact assessment process. The FWS also recommended avoidance of wetland impacts and protection of other rare species, such as the Bald Eagle (*Halieaeetus leucocephalus*) and state species of concern. The FWS Virginia Field Office noted the minimal land area in Virginia managed by the NPS and concurred with the recommendations made by the FWS Chesapeake Bay Field Office. Following approval of the GMP/EIS, the NPS will consult with the FWS in accordance with the requirements of section 7 of the Threatened and Endangered Species Act of 1973.

## 5.4 Consultation with State Natural Resource Management Agencies

On June 21, 2010, the NPS sent letters to the Maryland Natural Heritage Program, the Virginia Division of Natural Heritage, and the Virginia Department of Game and Inland Fisheries for consultation purposes.

The Maryland Natural Heritage Program responded via email on August 30, 2010 providing a list of state rare, threatened, and endangered species found within the seashore and on the adjacent mainland (see appendix C). Maryland also provided GIS data detailing the location of ecologically significant areas, colonial waterbird colonies, rare and endangered species, and potential habitat of forest interior dwelling species.

The Virginia Division of Natural Heritage responded on August 6, 2010, providing a list of state rare, threatened, and endangered species found within the seashore and on the adjacent mainland, and noting the legal requirements related to natural heritage resources (see appendix C). On July 29, 2010, the Virginia Department of Game and Inland Fisheries provided a list of federal and state listed animals and species of special conservation concern known to occur in the general vicinity of Assateague Island (see appendix C).

## 5.5 Coastal Zone Management Act/Federal Consistency

The federal Coastal Zone Management Act of 1972 encourages appropriate development and protection of the nation's coastal and shoreline resources. The act assigns responsibility for managing coastal areas to the states. To assume this role, each state has adopted a coastal zone management program (CZMP) plan that describes the state's coastal resources and how these resources are managed. Activities and development affecting coastal resources, which involve the federal government, are evaluated through a process called "federal consistency". This allows the public, local governments, tribes, and state agencies an opportunity to review federal actions likely to affect coastal resource or uses. Three categories of activities trigger a federal consistency review: activities undertaken by a federal agency, activities that require federal approval, or activities that use federal funding.

NPS notified the Maryland and Virginia CZMPs at the beginning of the GMP planning process as part of project scoping, requesting information on resource constraints or concerns that might be a possible planning issue within the project area. The Maryland CZMP did not respond. The Virginia CZMP (Virginia Department of Environmental Quality) responded on July 7, 2010, outlining requirements for further coordination during plan review and providing a summary of general types of program concerns for actions proposed within the coastal zone (see appendix C).

Further consultation with each office will occur during public review of Draft GMP/EIS. Each CZMP office will receive copies of the Draft GMP/EIS and other materials to support a consistency determination. Additional consultation will occur to address any comments or concerns. As needed, the Draft GMP/EIS will be amended to ensure federal consistency.

## 5.6 Tribal Coordination

Indian tribes having possible cultural associations with the seashore include the Accohannock, Pocomoke, Nanticoke, and Assateague peoples. NPS sent a coordination letter to the Virginia Council of Indians on June 21, 2010. In response the council liaison requested continued involvement in the GMP process.

## 5.7 Draft GMP/EIS Document Review

The Draft GMP/EIS for the seashore will be open for public and agency review for 60 days following publication of the Environmental Protection Agency's notice of availability in the *Federal Register.* During the review period, the public will have opportunities to provide comments on the management alternatives, including the preferred alternative. The NPS PEPC web site and news releases will provide information on how the public can provide comments on the Draft GMP/EIS and on public meetings to be held during the review period.

The NPS will review and evaluate all public and agency comments received on the Draft GMP/EIS. A final GMP/EIS will respond to and/or incorporate all substantive comments. The final GMP/EIS will be available to the public for a 30-day no-action period, after which a record of decision may be prepared to document selection of an alternative as the approved GMP/EIS for the seashore.

As noted previously, the Draft GMP/EIS presents an overview of potential actions and impacts related to the management concepts for the seashore. Once a GMP/EIS is approved, implementation of actions in the approved GMP/EIS will be subject to site-specific planning and compliance in accordance with all applicable requirements.

## 5.8 List of Preparers

**Assateague Island National Seashore**

Angie Alvino, Administrative Officer
Richard Barrett, Chief, Maintenance (former)
Scott Bentley, Superintendent (former)
Karen Burns, Human Relations Specialist
Dana Condron, Protection Ranger
Rachelle Daigneault, Chief, Interpretation and Education (former)
Deborah Darden, Superintendent
Elizabeth Davis, Park Ranger, Interpretation
Michael Dixon, Visitor Services Manager (former)
Ish Ennis, Chief, Maintenance (former)
Michael Fager, Superintendent's Assistant (former)
Todd Garrett, Protection Ranger (former)
Pat Greer, Administrative Office (former)
Randy Hartz, Maintenance Mechanic Supervisor
Bill Hulslander, Chief, Natural Resources
Bill Ingraham, Maryland Maintenance Foreman (former)
Regina Jones-Brake, Management Assistant (former)
Patricia Kicklighter, Superintendent (former)
Gretchen Knapp, Park Ranger, Interpretation
Jack Kumer, Wildlife Manager
Debbie Morlock, Concessions Management Specialist
Ted Morlock, Chief Ranger (former)
Dave Rapp, Protection Ranger (former)
Courtney Schupp, Coastal Geologist (former)
Chris Seymour, Park Ranger, Interpretation (former)
Brian Sturgis, Estuarine Ecologist
Mark Sturm, Terrestrial Ecologist (former)
Jeanne Taylor, Administrative Support Assistant
Helen Violli, Ecologist (former)
Walter West, Chief Ranger
Neil Winn, GIS Specialist
Carl Zimmerman, Chief, Resource Management (former)

**Northeast Regional Office, National Park Service**

Mark Alexander, Program Manager, Line Item Construction Program
Michael Caldwell, Regional Director
Christine Gobrial, Community Planner (former)
Ellen Carlson, Community Planner/Legislative Liaison
Claire Comer, Interpretive Specialist, Shenandoah National Park
Allen Cooper, Chief, Senior Planner

Shaun Eyring, Chief, Resource Planning and Compliance
Maryanne Gerbauckas, Associate Regional Director, Resource Stewardship (former)
Elizabeth Igleheart, National Register Coordinator (former)
John F. Karish, Chief, Science (former)
Jacki Katzmire, Regional Environmental Coordinator
Megan Lang, Community Planner
Helen Mahan, Community Planner
Jonathan Meade, Deputy Regional Director
Terrence Moore, Chief, Park Planning and Special Studies (former)
John Piltzecker, Assoc Regional Director, Construction and Facility Management (former)
Michael Quijano-West, Chief, Park Planning and Special Studies
Patti Rafferty, Coastal Ecologist
Dennis Reidenbach, Regional Director (former)
Charles T. Roman, Research Coordinator North Atlantic Coast
Cheryl Sams, Historical Landscape Architect
Brian Strack, Associate Regional Director, Planning, Facilities, and Conservation Assistance
Gay Vietzke, Deputy Regional Director

**U.S. Department of the Interior, Solicitor's Office**

Robin Lepore, Senior Attorney (former)

**Chincoteague National Wildlife Refuge**

Kim Halpin, Assistant Refuge Manager (former)
Lou Hinds, Refuge Manager (former)
Kevin Sloan, Refuge Manager

**Wallace Roberts & Todd, LLC**

Elizabeth Clarke, Principal and Project Manager
Kelly Ream, AICP, Landscape Designer, Planner, and Graphic Designer

**Total Quality NEPA**

Heidi West, PhD (Natural Resources – Affected Environment)

**Cucinotta & Associates**

Sara Cucinotta (Newsletter 1 – Graphic Design)

## 5.9 List of Draft GMP/EIS Recipients

The Draft GMP/EIS has been made available on the NPS Planning, Environment and Public Comment (PEPC) website to over 600 individuals and organizations on the seashore's mailing list. Copies of and links to the Draft GMP/EIS have been distributed to the following officials, government agencies, and non-government organizations and institutions:

- **Congressional and State Delegations**

  Maryland
  - U.S. Senator Benjamin L. Cardin
  - U.S. Senator Barbara A. Mikulski
  - Representative Andy Harris
  - Maryland State Delegate (38A) Charles J. Otto
  - Maryland State Delegate (38C) Mary Beth Carozza

  Virginia
  - U.S. Senator Timothy Kaine
  - U.S. Senator Mark Warner
  - Representative Scott E. Rigell
  - Virginia State Senator Lynwood W. Lewis, Jr.
  - Virginia State Delegate Robert S. Bloxom, Jr.

- **Federal Agencies**

  Advisory Council on Historic Preservation
  US Environmental Protection Agency
  US Department of Commerce, National Oceanic and Atmospheric Administration
  Fisheries Service
  US Department of Defense
  - Department of the Army, US Army Corps of Engineers
    - Baltimore District
    - Norfolk District
  - US Coast Guard

  US Department of Transportation, Federal Highway Administration
  US Fish and Wildlife Service
  - Ecological Services Field Offices
    - Chesapeake Bay Office
    - Virginia Field Office
  - National Wildlife Refuges
    - Chincoteague National Wildlife Refuge
  - Regional Offices
    - Northeast Regional Office
    - Washington Office

- **State Agencies**

  State of Maryland
  - Department of Business and Economic Development, Office of Tourism Development
  - Department of the Environment
  - Department of Natural Resources
  - Department of Transportation, Maryland State Highway Administration
  - Maryland Historic Trust
  - Maryland Park Service, Assateague State Park

  Commonwealth of Virginia
  - Department of Conservation and Recreation
  - Department of Environmental Quality
  - Department of Game and Inland Fisheries
  - Department of Historic Resources
  - Department of Transportation
  - Virginia Marine Resources Commission

- **Local Agencies**

  Accomack County, Virginia
  - Board of Supervisors
  - Department of Planning
  - Department of Parks and Recreation

  Worcester County, Maryland
  - County Commission
  - Department of Economic Development
  - Department of Environmental Programs
  - Department of Tourism
  - Department of Recreation and Parks

  Town of Berlin, Maryland

  Town of Ocean City, Maryland

  Town of Snow Hill, Maryland

  Town of Chincoteague, Virginia

- **Tribes and American Indian Organizations**

  Maryland Commission of Indian Affairs

  Virginia Council on Indians

- **Partner Organizations**

  Assateague Coastal Trust

  Assateague Island Alliance

  Assateague Mobile Sportfishermen's Association

  Audubon Society of Maryland-DC

  Berlin Maryland Chamber of Commerce

  Chincoteague Chamber of Commerce

  Chincoteague Volunteer Fire Company

Eastern National
Eastern Shore of Virginia Chamber of Commerce
Eastern Shore Tourism Commission
Marine Science Consortium, Wallops Island
Maryland Coastal Bays Program
National Parks Conservation Association
Ocean City Chamber of Commerce
Ocean Pines Homeowners Association
Salisbury University
University of Maryland Eastern Shore
University of Maryland Horn Point Environmental Laboratory

# APPENDICES


**Appendix A** Assateague Island National Seashore Enabling Legislation ..... A-1

**Appendix B** Memorandum of Understanding between the National Park Service and the U.S. Fish and Wildlife Service for Interagency Cooperation at Assateague Island National Seashore and Chincoteague National Wildlife Refuge ..... B-1

**Appendix C** Agency Correspondence ..... C-1

**Appendix D** Summary of Public Involvement Activities ..... D-1

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Appendix A

# Assateague Island National Seashore – Enabling Legislation

## Table of Contents

Table A.1 Assateague Island National Seashore – Summary of Enabling Legislation and Amendments.....A-1

Public Law 89-195, as amended (16 U.S.C. Title 16 Section 459f).....A-2

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**Table A.1 Assateague Island National Seashore – Summary of Enabling Legislation and Amendments**

| Year | Public Law | Statute | Summary |
|---|---|---|---|
| **1965** | **PL 89-195** | **79 Stat. 824** | Includes enabling legislation for Assateague Island National Seashore (see following pages A-2 to A-9) |
| **1976** | **PL 94-578** | **90 Stat. 2733** | Repealed in entirety §459f–7 which provided for construction of overnight and other public accommodation facilities, land selection and land fill, concession facilities, and the promulgation of rules and regulations covering those areas by the Secretary of the Interior<br>Repealed in entirety §459f–9 which provided for construction of a road from the Chincoteague-Assateague Island Bridge to 1) an area in the wildlife refuge deemed appropriate for recreation purposes, and 2) the Sandy Point-Assateague Bridge<br>Created new §459f–11 directing the Secretary of the Interior to develop and transmit to Congress a comprehensive plan for the protection, management, and use of the seashore |
| **1990** | **PL 101-512** | **104 Stat. 1924** | Authorized an increase in potential land acquisition on the mainland for an administrative site from 10 acres to 16 acres (amendment to §459f–2)<br>Increased the amount of federal land within the seashore boundary that could be transferred without consideration to the administrative jurisdiction of the Secretary of the Interior from 10 acres to 16 acres (amendment to §459f–2)<br>Increased the amount of non-federal property on the mainland that could be acquired by exchange by the Secretary of the Interior from 10 acres to 16 acres (amendment to §459f–2) |
| **1992** | **PL 102-320** | **106 Stat. 321** | Authorized an increase in potential land acquisition on the mainland for an administrative site from 16 acres to 112 acres (amendment to §459f–2)<br>Removed the limitation (previously limited to 16 acres) on transfer of federal land within the seashore boundary without consideration to the administrative jurisdiction of the Secretary of the Interior (amendment to §459f–2)<br>Authorized acceptance of the donation of a scenic easement covering the “Woodcock Property” adjacent to the seashore (amendment to §459f–2)<br>Removed the limitation (previously limited to 16 acres) on the amount of non-federal property on the mainland that could be acquired by exchange by the Secretary of the Interior (§459f–2)<br>Authorized the Secretary of the Interior to enter into cooperative agreements with local, state and federal agencies, and with educational institutions and non-profit entities to coordinate research and to provide technical assistance to ensure full protection of the natural and cultural resources of the seashore consistent with the purposes for which the seashore was established and other applicable law (amendment to §459f**–5**) |

# 16 U.S.C. Title 16 Section 459f

**§459f. Assateague Island National Seashore; purposes; description of area**

For the purpose of protecting and developing Assateague Island in the States of Maryland and Virginia and certain adjacent waters and small marsh islands for public outdoor recreation use and enjoyment, the Assateague Island National Seashore (hereinafter referred to as the "seashore") shall be established and administered in accordance with the provisions of sections 459f to 459f–11 of this title. The seashore shall comprise the area within Assateague Island and the small marsh islands adjacent thereto, together with the adjacent water areas not more than one-half mile beyond the mean high waterline of the land portions as generally depicted on a map identified as "Proposed Assateague Island National Seashore, Boundary Map, NS–AI–7100A, November, 1964", which map shall be on file and available for public inspection in the offices of the Department of the Interior.

(Pub. L. 89–195, §1, Sept. 21, 1965, 79 Stat. 824.)

**§459f–1. Acquisition of property**

**(a) Authority of Secretary; manner and place; fair market value; concurrence of State owner; transfer from Federal agency to administrative jurisdiction of Secretary**

Within the boundaries of the seashore, the Secretary of the Interior (hereinafter referred to as the "Secretary") is authorized to acquire lands, waters, and other property, or any interest therein, by donation, purchase with donated or appropriated funds, exchange, or in such other method as he may find to be in the public interest. The Secretary is authorized to include within the boundaries of the seashore, not to exceed 112 acres of land or interests therein on the mainland in Worcester County, Maryland. In the case of acquisition by negotiated purchase, the property owners shall be paid the fair market value by the Secretary. Any property or interests therein owned by the States of Maryland or Virginia shall be acquired only with the concurrence of such owner. Notwithstanding any other provision of law, any Federal property located within the boundaries of the seashore may, with the concurrence of the agency having custody thereof, be transferred without consideration to the administrative jurisdiction of the Secretary for purposes of the seashore.

**(b) Exchange of property; cash equalization payments; scenic easement donation**

When acquiring lands by exchange, the Secretary may accept title to any non-Federal property within the boundaries of the seashore and convey to the grantor of such property any federally owned property under the jurisdiction of the Secretary which the Secretary classifies suitable for exchange or other disposal, and which is located in Maryland or Virginia. The properties so exchanged shall be approximately equal in fair market value, but the Secretary may accept cash from or pay cash to the grantor in order to equalize the values of the properties exchanged. Notwithstanding the acreage limitation set forth in sections 459f to 459f–11 of this title, the Secretary is authorized to accept the donation of a scenic easement covering the parcel of land adjacent to the seashore and known as the "Woodcock Property".

**(c) Bridge acquisition; amount of compensation; payment terms and conditions**

The Secretary is authorized to acquire all of the right, title, or interest of the Chincoteague-Assateague Bridge and Beach Authority, a political subdivision of the State of Virginia, in the bridge constructed by such authority across the Assateague Channel, together with all lands or interests therein, roads, parking lots, buildings, or other real or personal property of such authority, and to compensate the authority in such amount as will permit it to meet its valid outstanding obligations at the time of such acquisition. Payments by the Secretary shall be on such terms and conditions as he shall consider to be in the public interest. Any of the aforesaid property outside the boundaries of the national seashore, upon acquisition by the Secretary, shall be subject to his administration for purposes of the seashore.

**(d) Owner's reservation of right of use and occupancy for residential or hunting purposes for term of years; adjustment of compensation; rules and regulations for appearance of buildings; "improved property" defined**

Owners of improved property acquired by the Secretary may reserve for themselves and their successors or assigns a right of use and occupancy of the improved property for noncommercial residential purposes or for hunting purposes, as hereinafter provided, for a term that is not more than twenty-five years. In such cases, the Secretary shall pay to the owner of the property the fair market value thereof less the fair market value of the right retained by such owner: *Provided*, That such use and occupancy shall be subject to general rules and regulations established by the Secretary with respect to the outward appearance of any buildings on the lands involved. The term "improved property" as used in sections 459f to 459f–11 of this title shall mean (1) any single-family residence the construction of which was begun before January 1, 1964, and such amount of land, not in excess of three acres, on which the building is situated as the Secretary considers reasonably necessary to the noncommercial residential use of the building, and (2) any property fronting on the Chincoteague Bay or Sinepuxent Bay, including the offshore bay islands adjacent thereto, that is used chiefly for hunting and continues in such use: *Provided*, That the Secretary may exclude from improved properties any marsh, beach, or waters, together with so much of the land adjoining such marsh, beach, or waters as he deems necessary for public use or public access thereto.

(Pub. L. 89–195, §2, Sept. 21, 1965, 79 Stat. 824; Pub. L. 101–512, title I, Nov. 5, 1990, 104 Stat. 1924; Pub. L. 102–320, §1(1)–(4), July 10, 1992, 106 Stat. 321.)

**Amendments**

**1992**—Subsec. (a). Pub. L. 102–320, §1(1), (2), amended second and last sentences generally, substituting reference to 112 acres for reference to sixteen acres for an administrative site in second sentence and striking out reference in last sentence to sixteen acres of Federal property on the mainland in Worcester County, Maryland.

Subsec. (b). Pub. L. 102–320, §1(3), (4), amended first sentence generally, striking out reference to not more than sixteen acres of non-Federal property on the mainland in Worcester County, Maryland, and inserted at end "Notwithstanding the acreage limitation set forth in sections 459f to 459f–11 of this title, the Secretary is authorized to accept the donation of a scenic easement covering the parcel of land adjacent to the seashore and known as the 'Woodcock Property'."

**1990**—Subsecs. (a), (b). Pub. L. 101–512 substituted "sixteen acres" for "ten acres" wherever appearing.

**§459f–2. Compensation for bridge construction costs; acquisition of land for park purposes**

**(a) Bridge construction costs; compensation of State; limitation of amount**

If the bridge from Sandy Point to Assateague Island is operated by the State of Maryland as a toll-free facility, the Secretary is authorized and directed to compensate said State in the amount of two-thirds of the cost of constructing the bridge, including the cost of bridge approaches, engineering, and all other related costs, but the total amount of such compensation shall be not more than $1,000,000; and he is authorized to enter into agreements with the State of Maryland relating to the use and management of the bridge.

**(b) Acquisition or lease of Federal lands for State park purposes; terms and conditions; reversion upon noncompliance; consideration for lease; amount of payment for conveyance of title and improvements; limitation of reimbursement for beach protection**

The State of Maryland shall have the right to acquire or lease from the United States such lands, or interests therein, on the island north of the area now used as a State park as the State may from time to time determine to be needed for State park purposes, and the Secretary is authorized and directed to convey or lease such lands, or interests therein, to the State for such purposes upon terms and conditions which he deems will assure its public use in harmony with the purposes of sections 459f to 459f–11 of this title. In the event any of such terms and conditions are not complied with, all the property, or any portion thereof, shall, at the option of the Secretary,

revert to the United States, in its then existing condition. Any lease hereunder shall be for such consideration as the Secretary deems equitable; and any conveyance of title to land hereunder may be made only upon payment by the State of such amounts of money as were expended by the United States to acquire such land, or interests therein, and upon payments of such amounts as will reimburse the United States for the cost of any improvements placed thereon by the United States, including the cost to it of beach protection: *Provided*, That reimbursement for beach protection shall not exceed 30 per centum, as determined by the Secretary, of the total cost of the United States of such protection work.

(Pub. L. 89–195, §3, Sept. 21, 1965, 79 Stat. 825.)

**§459f–3. Establishment of Seashore; notice in Federal Register**

When the Secretary determines that land, water areas, or interests therein within the area generally depicted on the map referred to in section 459f of this title are owned or have been acquired by the United States in sufficient quantities to provide an administrable unit, he shall declare the establishment of the Assateague Island National Seashore by publication of notice thereof in the Federal Register. Such notice shall contain a refined description or map of the boundaries of the seashore as the Secretary may find desirable, and the exterior boundaries shall encompass an area as nearly as practicable identical to the area described in section 459f of this title.

(Pub. L. 89–195, §4, Sept. 21, 1965, 79 Stat. 825.)

**§459f–4. Hunting and fishing provisions**

The Secretary shall permit hunting and fishing on land and waters under his control within the seashore in accordance with the appropriate State laws, to the extent applicable, except that the Secretary may designate zones where, and establish periods when, no hunting or fishing shall be permitted for reasons of public safety, administration, fish or wildlife management or public use and enjoyment: *Provided*, That nothing in sections 459f to 459f–11 of this title, shall limit or interfere with the authority of the States to permit or to regulate shellfishing in any waters included in the national seashore: *Provided further*, That nothing in said sections shall add to or limit the authority of the Federal Government in its administration of Federal laws regulating migratory waterfowl. Except in emergencies, any regulations of the Secretary pursuant to this section shall be put into effect only after consultation with the appropriate State agency responsible for hunting and fishing activities. The provisions of this section shall not apply to the Chincoteague National Wildlife Refuge.

(Pub. L. 89–195, §5, Sept. 21, 1965, 79 Stat. 826.)

**§459f–5. Administration of Seashore**

**(a) Public outdoor recreation and enjoyment; utilization of other authorities**

Except as provided in subsection (b) of this section, the Secretary shall administer the Assateague Island National Seashore for general purposes of public outdoor recreation, including conservation of natural features contributing to public enjoyment. In the administration of the seashore and the administrative site the Secretary may utilize such statutory authorities relating to areas administered and supervised by the Secretary through the National Park Service and such statutory authority otherwise available to him for the conservation and management of natural resources as he deems appropriate to carry out the purposes of sections 459f to 459f–11 of this title.

**(b) Refuge land and waters; application of national wildlife refuge provisions; public recreation uses in accordance with provisions for national conservation recreational areas**

Notwithstanding any other provision of sections 459f to 459f–11 of this title, land and waters in the Chincoteague National Wildlife Refuge, which are a part of the seashore, shall be administered for refuge purposes under laws and regulations applicable to national wildlife refuges, including administration for public recreation uses in accordance with the provisions of the Act of September 28, 1962 (Public law 87–714; 76 Stat. 653) [16 U.S.C. 460k et seq.].

**(c) Cooperative agreements and technical assistance to protect seashore resources**

The Secretary is authorized to enter into cooperative agreements with local, State, and Federal agencies and with educational institutions and nonprofit entities to coordinate research designed to ensure full protection of the natural and cultural resources of the seashore, consistent with the purposes for which the seashore was established, and other applicable law. The Secretary is also authorized to provide technical assistance to local, State, and Federal agencies and to educational institutions and non-profit entities in order to further such purposes. The Secretary shall submit a report every two years to the Congress on the results of the coordinated research program authorized by this section and plans to implement the recommendations arising from such research.

(Pub. L. 89–195, §6, Sept. 21, 1965, 79 Stat. 826; Pub. L. 102–320, §1(5), July 10, 1992, 106 Stat. 321.)

**§459f–6. Repealed. Pub. L. 94–578, title III, §301, Oct. 21, 1976, 90 Stat. 2733**

Section, Pub. L. 89–195, §7, Sept. 21, 1965, 79 Stat. 826, made provision for the construction of overnight and other public accommodation facilities, land selection and land fill, concession facilities, and the promulgation of rules and regulations covering those areas by the Secretary of the Interior. See section 459f–11 of this title.

**§459f–7. Beach erosion control and hurricane protection**

The Secretary of the Interior and the Secretary of the Army shall cooperate in the study and formulation of plans for beach erosion control and hurricane protection of the seashore; and any such protective works that are undertaken by the Chief of Engineers, Department of the Army, shall be carried out in accordance with a plan that is acceptable to the Secretary of the Interior and is consistent with the purposes of sections 459f to 459f–11 of this title.

(Pub. L. 89–195, §8, Sept. 21, 1965, 79 Stat. 827.)

**§459f–8. Repealed. Pub. L. 94–578, title III, §301, Oct. 21, 1976, 90 Stat. 2733**

Section, Pub. L. 89–195, §9, Sept. 21, 1965, 79 Stat. 827, authorized and directed the Secretary of the Interior to construct and maintain a road from the Chincoteague-Assateague Island Bridge to an area in the wildlife refuge that he deemed appropriate for recreation purposes and to acquire the necessary lands and rights-of-way for a road from the Chincoteague-Assateague Island Bridge to the Sandy Point-Assateague Bridge. See section 459f–11 of this title.

**§459f–9. Public utility facilities; purchase of facilities without value to utility; amount of payment**

The Secretary of the Interior is authorized to purchase from a public utility any facilities of that utility which are no longer of value to it as a result of the establishment of the Assateague Island National Seashore and shall pay for such facilities an amount equal to the cost of constructing such facilities less depreciation.

(Pub. L. 89–195, §10, Sept. 21, 1965, 79 Stat. 827.)

**§459f–10. Authorization of appropriations**

There are hereby authorized to be appropriated the sum of not more than $22,400,000 (including such sums, together with interest, as may be necessary to satisfy final judgments rendered against the United States) for the acquisition of lands and interests in land and such sums as may be necessary for the development of the area authorized under sections 459f to 459f–11 of this title.

(Pub. L. 89–195, §11, Sept. 21, 1965, 79 Stat. 827; Pub. L. 92–272, title I, §101(1), Apr. 11, 1972, 86 Stat. 120; Pub. L. 94–578, title I, §101(2), Oct. 21, 1976, 90 Stat. 2732.)

**Amendments**

**1976**—Pub. L. 94–578 substituted “$22,400,000” for “$21,050,000”.

**1972**—Pub. L. 92–272 substituted "$21,050,000 (including such sums, together with interest, as may be necessary to satisfy final judgments rendered against the United States)" for "$16,250,000".

**§459f–11. Comprehensive plan for protection, management, and use of seashore**

**(a) Contents; transmittal to Congressional committees**

Within two years of October 21, 1976, the Secretary shall develop and transmit to the Committees on Interior and Insular Affairs of the Senate and the House of Representatives a comprehensive plan for the protection, management, and use of the seashore, to include but not be limited to the following considerations:

(1) measures for the full protection and management of the natural resources and natural ecosystems of the seashore;
(2) present and proposed uses of the seashore and the lands and waters adjacent or related thereto, the uses of which would reasonably be expected to influence the administration, use, and environmental quality of the seashore;
(3) plans for the development of facilities necessary and appropriate for visitor use and enjoyment of the seashore, with identification of resource and user carrying capacities, along with the anticipated costs for all proposed development;
(4) plans for visitor transportation systems integrated and coordinated with lands and facilities adjacent to, but outside of, the seashore; and
(5) plans for fostering the development of cooperative agreements and land and resource use patterns outside the seashore which would be compatible with the protection and management of the seashore.

**(b) Consultation by other Federal agencies with Secretary**

Notwithstanding any other provision of law, no Federal loan, grant, license, or other form of assistance for any project which, in the opinion of the Secretary would significantly adversely affect the administration, use, and environmental quality of the seashore shall be made, issued, or approved by the head of any Federal agency without first consulting with the Secretary to determine whether or not such project is consistent with the plan developed pursuant to this section and allowing him at least thirty days to comment in writing on such proposed action.

(Pub. L. 89–195, §12, as added Pub. L. 94–578, title III, §301, Oct. 21, 1976, 90 Stat. 2733.)

Appendix B

# Memorandum of Understanding between the National Park Service and U.S. Fish and Wildlife Service for Interagency Cooperation at Assateague Island National Seashore and Chincoteague National Wildlife Refuge

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# MEMORANDUM OF UNDERSTANDING

Agreement Number G4190120001
FWS Agreement Number FF05R00000-12-K002
Page 1 of 15

**Memorandum of Understanding**
**between the**
**National Park Service and U.S. Fish and Wildlife Service**
**for Interagency Cooperation at**
**Assateague Island National Seashore and Chincoteague National Wildlife Refuge**

This Memorandum of Understanding (hereinafter "Agreement") is entered into by and between the National Park Service (hereinafter "NPS"), U.S. Department of the Interior, acting through the Superintendent of Assateague Island National Seashore, and the U.S. Fish and Wildlife Service (hereinafter "FWS"), U.S. Department of the Interior, acting through the Refuge Manager of Chincoteague National Wildlife Refuge.

## ARTICLE I – BACKGROUND

Chincoteague National Wildlife Refuge (CNWR) was established on Assateague Island in 1943 to be administered by the FWS under the authority of the Migratory Bird Conservation Act. In 1959, under the authority of Public Law 85-57, the Secretary of the Interior granted to the Chincoteague-Assateague Bridge and Beach Authority (Beach Authority) an easement to build a bridge to and roadway across CNWR to the Toms Cove Hook area. Coincident to the easement, the FWS entered into an agreement with the Beach Authority allowing the development and operation of a public beach and recreational facilities. These actions were taken in recognition of the need for public recreational facilities on the Virginia portion of Assateague Island and under the assumption that regulated public use of the Toms Cove area could be permitted without preventing accomplishment of the purposes for which CNWR was established.

Assateague Island National Seashore (ASIS) was established in 1965 under Public Law 89-195 and its boundary drawn to encompass CNWR. Section 2(c) of P.L. 89-195 authorized the Secretary of the Interior to acquire all of the rights, title, or interests of the Beach Authority, including its real and personal property. When the acquisition was accomplished with NPS appropriations in 1966, the former Beach Authority easements merged with the United States' ownership interests.

Section 6(a) of Public Law 89-195 directs the Secretary of the Interior to administer ASIS for the general purposes of outdoor public recreation. This has been interpreted by the Secretary as also directing the NPS to aid the FWS in providing public recreation within the boundaries of CWNR. Public Law 89-195 stipulates, however, that the "land and waters in CNWR, which are a part of the seashore, shall be administered for refuge purposes under laws and regulations applicable to national wildlife refuges, including administration for public recreation uses in accordance with the provisions of the Refuge Recreation act of September 28, 1962 (P.L. 87-714)." The act authorizes the Secretary to administer refuges for recreational use, when such uses do not interfere with the area's primary purposes.

Amendments to the National Wildlife Refuge System Administration Act in 1976 (P.L. 94-223) direct that all areas in the system "shall be administered by the Secretary through the United States Fish and Wildlife Service", and that the FWS has ultimate decision-making authority within refuges. Subsequent opinions by Department of the Interior solicitors affirmed the authority of the FWS to cooperate with other Federal agencies in carrying out their responsibilities, and the NPS role in administering public recreation in the Toms Cove area as approved by the FWS.

The National Wildlife Refuge System Improvement Act of 1997 (P.L. 105-57) provides guidance to the Secretary for the overall management of the Refuge System. Key components of the Act include a strong wildlife conservation mission for the Refuge System; a process for determining compatible uses of refuges; a recognition that wildlife-dependent recreational uses involving hunting, fishing, wildlife observation and photography, and environmental education and interpretation, when determined to be compatible, are appropriate public uses of refuges; and

that compatible wildlife-dependent recreational uses are the priority public uses of the Refuge System.

Although beach recreation is not one of the priority public uses of refuges, legislative directives related to the management of Assateague Island by the FWS and NPS have made clear that beach recreation is an appropriate activity within CNWR so long as it remains compatible with the overall purposes of the Refuge. The continued appropriateness of beach recreation at CNRW was affirmed in an approved 2004 Compatibility Determination.

## ARTICLE II – PURPOSE AND OBJECTIVES

The cooperative relationship between the NPS and FWS on Assateague Island has been defined in a series of agreements dating back to 1966; all of which have assigned certain management responsibilities to each of the two agencies. The agreements have evolved over time, reflecting changes in management goals as well as legislative changes to agency authority and administrative requirements.

The purpose of this Agreement is to provide an updated and contemporary framework for effective and efficient interagency cooperation on Assateague Island. This Agreement, unless otherwise specified, applies to the management of that portion of Assateague Island in the general vicinity of Toms Cove referred to as the "Assigned Area", depicted on a map attached to and made a part of this Agreement. Should the Assigned Area change, this Agreement will be amended to address any associated changes in management responsibilities or administrative requirements.

The specific objectives of both the FWS and NPS with respect to management of the Assigned Area on Assateague Island are:

A. To protect and enhance refuge and park resources, as well as the appropriate enjoyment and appreciation of same by the public;

B. To provide high quality recreational, interpretive, and educational opportunities for the visiting public;

C. To reduce confusion regarding each agencies' roles and responsibilities

D. To eliminate unnecessary duplication of services, permitting, paperwork, and reviews.

E. To effectively utilize the experience, skills, and expertise of the two agencies' personnel.

This Agreement supersedes and replaces the General Agreement dated October 18, 2001 between the FWS and NPS pertaining to the administration, development, and use of the Assigned Area on Assateague Island. Cooperative operational activities covered by this Agreement include visitor services, interpretive services, visitor and resource protection, facility management, land and resource management, and interagency communications. Cooperative law enforcement activities are further defined under a separate agreement.

## ARTICLE III – AUTHORITY

Pursuant to 16 U.S.C. §1a-2(*l*), the NPS is authorized to cooperate with Federal, State and local park agencies for the more effective and efficient management of adjacent park areas, so long as the administrative responsibilities for any unit of the National Park System are not transferred.

## ARTICLE IV – STATEMENT OF AGREEMENT FOR OPERATIONAL ACTIVITIES

### A. Visitor Services

1. The NPS will:
   a. Plan, facilitate, support, and manage appropriate recreational activities within the Assigned Area and other areas of NPS jurisdiction. Activities include swimming,

fishing, motorized and non-motorized boating, clamming and crabbing, bird watching, beach combing, sightseeing, and other similar visitor uses compatible with the FWS and NPS missions.

b. Consult with FWS prior to initiating or allowing any new or non-traditional recreational activities within the Assigned Area.
c. Assist in the day to day management of over-sand vehicle (OSV) use within the designated OSV zone by issuing permits, educating permit holders on OSV use regulations, and assisting the FWS with enforcing OSV use regulations, limits, and closures. Vehicle and equipment standards will be as defined by 36 CFR, 7.65(b).
d. Operate and manage a lifeguarded beach during the peak visitor use season in accordance with NPS policies and practices. The NPS will:
    i. Have sole supervisory responsibility for lifeguards and lifeguard operations, including closure of the lifeguard protected beach for public safety. All beach closures require the approval of the Chief Lifeguard or his delegated supervisor.
    ii. Use all-terrain vehicles (ATVs) in conducting lifeguard operations (including emergency medical response) within the Assigned Area.
    iii. Provide 'First Responder' response by lifeguards to medical emergencies within the Assigned Area with continued emergency medical services as per the existing Memorandum of Agreement with the FWS and Town of Chincoteague.

2. The FWS will:
    a. Provide annual guidance for management of the OSV zone, to be defined and agreed to in advance through the Annual Operating Plan (AOP) as per Article V of this Agreement.
    b. Define, on an annual basis through the AOP, the locations, circumstances, and conditions under which NPS lifeguards may operate outside of the Assigned Area (including use of ATVs for emergency response).
    c. Assume primary responsibility for permitting all special park uses (Special use, research, photographic, etc.) within the Assigned Area.
    d. Consult with the NPS about any special park uses with potential to affect normal visitor use or NPS operations within the Assigned Area. If it is determined that the

proposed use will affect visitor use or NPS operations in the assigned area, the NPS will manage the permitting process.

e. Provide government-owned housing, as available, at standard rates for NPS seasonal employees and volunteers working in the Virginia District of ASIS. The amount of housing available for NPS employees and volunteers will be defined and agreed to in the AOP, as per Article V of this Agreement.

3. The NPS and FWS will jointly:
   a. Define the size of the lifeguarded beach, dates and times of operation, staffing levels, and the number, type and location of lifeguard stands on an annual basis in the AOP.
   b. Honor entrance passes issued by the other agency
      i. NPS will, in Maryland, honor valid daily and seven-day entrance passes, Federal Duck Stamps, and CNWR Annual Passes issued by the FWS.
      ii. FWS will, in Virginia, honor valid seven-day entrance passes, National Park Passes, and ASIS Annual Passes issued by the NPS.
      iii. Both agencies will honor valid "America the Beautiful" Annual, Senior, Access, and Volunteer passes.

**B. Interpretive Services**

1. The NPS will:
   a. Plan, develop, and provide to the public appropriate interpretive and educational programs and activities (including the placement of waysides, kiosks, etc.). Unless otherwise approved by the FWS, these actions will take place exclusively within the Assigned Area or other areas of NPS jurisdiction including NPS-owned bridges, NPS visitor center, and waters within the Seashore boundary.
   b. Operate the NPS visitor center within the assigned area with sole responsibility for thematic content, activities, staffing, and maintenance.
      i. Coordinate operation of an Eastern National (EN) sales outlet in visitor center.
      ii. Avoid the duplication of sales items with the Chincoteague Natural History Association operated sales outlet in the FWS visitor center.

c. Recruit, train, supervise, and manage volunteers in accordance with NPS policies and practices to assist in providing those visitor services in the assigned area for which the NPS has primary responsibility.

2. The FWS will:
   a. Allow intermittent use of the FWS visitor center, as available, without charge by NPS for special interpretive programs and events. The schedule and purpose of these special events will be defined and agreed to in the AOP.
   b. Avoid the duplication of sales items in the FWS visitor center with the Eastern National operated sales outlet in the NPS visitor center.

3. The NPS and FWS will jointly:
   a. Define the emphasis of each agency's interpretative programs and the locations where each will provide interpretive services to avoid overlap and/or duplication of effort. The types and location of activities will be defined and agreed to in the AOP.
   b. Consult with one another prior to conducting activities which overlap with the other agency's interpretive activities or locations.
   c. Define the locations within the Assigned Area where cooperators may provide interpretive services, and adopt scheduling protocols and lines of communication to assure that cooperator programs do not conflict with agency activities. The types and location of cooperator activities will be defined and agreed to in the AOP.
   d. Provide mutual assistance in interpretive planning and programming. Major or recurring assistance requires advanced approval and will be defined and agreed to in the AOP.
   e. Review and approve, as appropriate, any materials distributed by the other agency or their authorized cooperators dealing with agency policies and/or management. Review/approval will be by the CNWR Refuge manager and ASIS Superintendent.
   f. Collaborate in training or cross-training volunteers as necessary to meet shared objectives.
   g. Share volunteers as necessary and desirable to meet shared objectives. Major or recurring sharing of volunteers will be defined and agreed to in the AOP.

**C. Visitor and Resource Protection**

1. The NPS and FWS will jointly:
   a. Integrate the law enforcement operations and activities of both agencies within ASIS/CNWR to enhance the existing agency partnership, eliminate employee confusion and lack of direction during incidents, and provide quality resource and visitor protection services within the limits of existing resources and staffing.
      i. All activities of the NPS/FWS integrated law enforcement operation will be conducted as per the ASIS/CNWR Cooperative Law Enforcement Agreement.
      ii. For the purpose of this Agreement, ASIS/CNWR is defined as the NPS and FWS lands and waters within the Virginia portion of ASIS, and the lands and waters within CNWR and Wallops Island NWR.
   c. Provide 'First Responder' response to medical emergencies with continued emergency medical services provided as per the existing Memorandum of Agreement between the NPS, FWS and Town of Chincoteague.
   d. Respond to and support emergency operations within ASIS/CNWR including, but not limited to wild land fires, hazardous material spills, storms and other weather related emergencies as per the ASIS/CNWR Cooperative Law Enforcement Agreement.
   e. Support the operation and maintenance of existing and future radio communications equipment and infrastructure.

**D. Facility Management**

1. The NPS will:
   a. Visitor Use Facilities and Infrastructure
      i. Conduct all normal maintenance, repair, and upkeep of NPS visitor use facilities and infrastructure, including roads, bridges, and parking lots within the Assigned Area and other locations of NPS jurisdiction. All such activities shall be consistent with NPS policies, procedures, and standards.
      ii. Consult with FWS prior to initiating any new construction or substantive modification/repair/rehabilitation of NPS visitor use facilities and infrastructure,

including the use or movement of sand resources within the Assigned Area, to ensure compatibility with the CNWR mission.

iii. Conduct all necessary compliance and permitting actions associated with facility management activities in the Assigned Area and other locations of NPS jurisdiction.

b. Operational Facilities and Infrastructure

i. Conduct all maintenance, repair, and upkeep of NPS operational facilities and infrastructure in the areas assigned for that purpose by the FWS within CNWR and Wallops Island NWR.

ii. Consult with FWS prior to initiating any substantive modification/repair/ rehabilitation of NPS operational facilities and infrastructure to ensure compatibility with the CNWR mission.

iii. Conduct all necessary compliance and permitting actions associated with the management of NPS operational facilities and infrastructure.

c. Assateague Beach Coast Guard Station

Provide normal maintenance, repair, and upkeep of the former Assateague Beach Coast Guard Station complex and associated utility systems.

d. Signage

Provide and maintain appropriate and adequate signage in the Assigned Area and other locations of NPS jurisdiction.

e. State Line Fence

Maintain the state line fence separating ASIS and CNWR for the primary purpose of restricting the movement of NPS horses and permitted OSVs onto the Refuge

2. The FWS will:

a. Provide sites within the CNWR complex on both the Island and mainland sufficient to support NPS operational activities including vehicle/equipment storage, facility management, and other operational needs including housing for seasonal/temporary NPS employees.

b. Provide the NPS with year round access across CNWR lands to the former Assateague Beach Coast Guard Station. The presence of sensitive resources may require the NPS to coordinate travel through certain areas with the FWS.
c. Maintain access to the Maryland/Virginia state line, as feasible, and assist the NPS in state line fence maintenance activities when requested and as available.
d. Take the lead role in all required compliance and permitting actions related to any future relocation of the Assigned Area and associated construction of new visitor use facilities and infrastructure.

3. The NPS and FWS will jointly:
   a. Assist one another in maintenance and facility management activities to the extent practicable or as agreed to by the Park Superintendent and Refuge Manager. This may include the sharing of equipment, staff, or facilities. Major or recurring assistance will be defined and agreed to in the AOP.
   b. Identify essential maintenance employees in the AOP who will report during winter weather emergencies to conduct response activities such as snow removal.
   c. Cooperate in sign management for the Park and Refuge. Except as otherwise agreed to, all signs within the Park/Refuge should be consistent in appearance and refrain from identifying agency names. The exceptions to this general rule are directional signs outside of the Park/Refuge, signs at the Park/Refuge entrance where both agencies should be given full recognition, and signs for the visitor centers which may recognize the operating agency only.

## E. Land and Resource Management

1. The FWS will:
   a. As with the entire Virginia portion of Assateague Island, assume primary responsibility for managing the wildlife and other natural resources within the Assigned Area, with the understanding by both agencies that recreational use will be planned and carried out to minimize adverse impacts.

2. The NPS and FWS will jointly:

a. Collaborate in natural and cultural resource management and related research activities including, but not limited to, invasive species control, threatened species management, and hunting management. Where appropriate, research findings and other resource information will be shared, activities of mutual interest will be planned jointly, professional expertise will be shared, and technology transfer will occur.
b. Recognize that each agency has distinct policies and approaches to resource management but that management of the barrier island ecosystem as a whole is environmentally sound.
c. To the extent allowed by their respective missions, seek to manage the land and waters of Assateague in a manner that protects, restores, and enhances the ecological health of the barrier island system.

**F. Interagency Communications and Information Sharing**

1. The NPS and FWS will jointly:
   a. Notify one another as soon as possible about all incidents, problems, violations, or management actions (e.g weather emergencies, Refuge closures, storm response) with potential ramifications for the other agency.
   b. Designate points of contact for each primary operational area covered by this Agreement (visitor services, interpretation, visitor and resource protection, maintenance, resource management, and administration). These individuals will meet at least twice annually (March-April and September-October) to identify and discuss the specifics of the AOP, operational problems or issues, and other matters of mutual concern.
   c. Coordinate the production and release of all publications, press releases, and other publically distributed information related to the Assigned Area or other areas of shared responsibility.
   d. Seek to keep one another informed about their respective activities and share all information of potential interest to the other agency.
   e. Cooperate in the collection, analysis and reporting of visitor use statistics. Insofar as possible, similar methods will be used by both agencies to collect and tabulate visitor use data. Monthly visitor use statistics and reports will be shared between agencies.

**ARTICLE V – ANNUAL OPERATING PLAN**

The NPS and FWS will jointly develop an Annual Operating Plan by December 1st of each year covering cooperative activities for the following calendar year. The AOP will define specific details of the aforementioned cooperative operational activities authorized by this Agreement. The AOP will be approved annually by the ASIS Superintendent and the CNWR Refuge Manager.

**ARTICLE VI – TERM OF AGREEMENT**

This Agreement will be effective for a period of five years from the date of final signature, unless it is terminated earlier by one of the parties pursuant to Article VII below.

**ARTICLE VII– MODIFICATION AND TERMINATION**

A. This Agreement may be modified only by a written instrument executed by the parties.

B. Either party may terminate this Agreement by providing the other party with thirty (30) days advance written notice. In the event that one party provides the other party with notice of its intention to terminate, the parties will meet promptly to discuss the reasons for the notice and try to resolve their differences.

**ARTICLE VIII – KEY OFFICIALS**

A. Key officials are essential to ensure maximum coordination and communication between the parties and the work being performed. They are:

1. For the National Park Service:

   Patricia Kicklighter
   Superintendent
   Assateague Island National Seashore
   7206 National Seashore Lane
   Berlin, MD 21811
   E-mail: trish_kicklighter@nps.gov
   Telephone: (410) 629-6080
   Facsimile: (410) 641-1099

2. For the U.S. Fish and Wildlife Service:

   Louis Hinds
   Refuge Manager
   Chincoteague National Wildlife Refuge
   PO Box 62
   Chincoteague, VA 23336
   E-mail: louis_hinds@fws.gov
   Telephone: (757) 336-6122
   Facsimile: (757) 336-5273

B. Changes in Key Officials – Neither the NPS or FWS may make any permanent change in a key official without written notice to the other party reasonably in advance of the proposed change.

**ARTICLE IX – SIGNATURES**

IN WITNESS WHEREOF, the parties hereto have executed this Agreement on the date(s) set forth below.

FOR THE NATIONAL PARK SERVICE:

Signature: Patricia Kicklighter

Name: Patricia Kicklighter

Title: Superintendent, Assateague Island National Seashore

Date: 1/10/2012

Concur: Dennis R. Reidenbach

Name: Dennis R. Reidenbach

Title: Regional Director, Northeast Region

Date: 3/8/2012

FOR THE U.S. FISH AND WILDLIFE SERVICE:

Signature: Louis S. Hinds

Name: Louis Hinds

Title: Refuge Manager, Chincoteague National Wildlife Refuge

Date: 12, JAN. 2012

Concur:

Name: Wendi Weber

Title: Regional Director, Northeast Region

Date: 1/31/12

**Assateague Island National Seashore**

US Department of the Interior
National Park Service

# National Park Service Assigned Area

Memorandum of Understanding G4190120001

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Appendix C

# Agency Correspondence

## Table of Contents

Response Letter Received from Maryland Historical Trust (July 7, 2010) ..... C-1

Response Email Received from Maryland Natural Heritage Program (August 30, 2010 and July 8, 2010) ..... C-2

Response Letter Received from Virginia Department of Conservation and Recreation (August 6, 2010) ..... C-4

Response Email Received from Virginia Department of Game and Inland Fisheries (July 29, 2010) ..... C-9

Response Letter Received from Virginia Department of Environmental Quality (July 7, 2010) ..... C-10

Response Letter Received from National Marine Fisheries (July 22, 2010) ..... C-13

Response Letter Received from Maryland Historical Trust Re: Determination of Effect on Hunting Camps and Related Properties (June 29, 2012) ..... C-15

Response Letter Received from US FWS, Chesapeake Bay Field Office (July 25, 2012) ..... C-16

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Maryland Department of Planning
Maryland Historical Trust

Martin O'Malley
Governor

Anthony G. Brown
Lt. Governor

Richard Eberhart Hall
Secretary

Matthew J. Power
Deputy Secretary

July 7, 2010

Trish Kicklighter, Superintendent
Assateague Island National Seashore
National Park Service
7206 National Seashore Lane
Berlin, MD 21811

Re: Commencement of a new General Management Plan (GMP)
Assateague Island National Seashore
Worcester County, Maryland

Dear Superintendent Kicklighter:

Thank you for your recent letter, dated June 21, 2010 and received by the Maryland Historical Trust (Trust) on June 22, 2010, regarding the above-referenced initiative. The Trust, Maryland's State Historic Preservation Office, is involved in the review of undertakings at the park for effects on historic and archeological properties, pursuant to Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended. We appreciate the opportunity to participate in the park's planning efforts with regards to historic preservation issues in the Maryland section of the property.

According to your letter, NPS is beginning to develop a new General Management Plan (GMP) for Assateague Island National Seashore. The new GMP will provide a comprehensive framework for managing the park over the next 15 – 20 years. We understand that NPS intends to integrate its NEPA and Section 106 processes through the development of an EIS. To achieve that goal, it is important that the EIS contains sufficient information and documentation regarding the identification of historic properties, assessment of effects on those properties, public involvement related to historic preservation concerns, consultation efforts under Section 106, and other principles specified in 36 CFR 800.8. We look forward to ongoing coordination with NPS, and other involved parties, to ensure the successful completion of Section 106 consultation during the GMP development process.

If you have questions or need further assistance, please contact Jonathan Sager (for historic buildings and landscape issues) at jsager@mdp.state.md.us / 410-514-7636 or me (for archeology) at bcole@mdp.state.md.us / 410-514-7631. Thank you for notifying the Trust of this important initiative and inviting us to participate in the planning process.

Sincerely,

Beth Cole

Beth Cole
Administrator, Project Review and Compliance

EJC/201003124

cc: Carl Zimmerman (NPS – Assateague)

100 Community Place • Crownsville, Maryland 21032-2023
Telephone: 410.514.7600 • Fax: 410.987.4071 • Toll Free: 1.800.756.0119 • TTY Users: Maryland Relay
Internet: www.marylandhistoricaltrust.net

**Carl Zimmerman/ASIS/NPS**
04/20/2012 02:04 PM

To Neil Winn/ASIS/NPS
cc
bcc
Subject Fw: MDDNR-NHP Resource data for General Mgmt Plan

**"Davidson, Lynn M." <LDAVIDSON@dnr.state.md.us>**
08/30/2010 03:52 PM

To "'carl_zimmerman@nps.gov'" <carl_zimmerman@nps.gov>
cc "Brinker, Dave" <DBRINKER@dnr.state.md.us>
Subject MDDNR-NHP Resource data for General Mgmt Plan

Carl,
I've attached a winzip file that contains 4 shapefiles and one excel table:
NHP_ESA_AINS.shp contains our conservation boundaries for Ecologically Significant Areas on both Assateague and the mainland within 2 miles, per our discussion.
NHP_CWC_AINS.shp contains points for the location of Colonial Waterbird Colonies on Assateague and islands in the Coastal Bays below the Rt. 50 bridge.
NHP_EORep_AINS.shp contains polygons depicting the locations of rare & endangered species (& a few natural communities) on Assateague Island.
NHP_FIDS_AINS.shp contains polygons depicting the POTENTIAL HABITAT of Forest Interior Dwelling Species (birds, primarily) on the mainland, including any polygon that is within or overlaps the 2-mile buffer distance.
NHP_RTE_2mibuff-mainland_AINS.xls contains a listing of the rare, threatened and endangered species found within the 12-digit HUC watersheds, with a link to the ESA name as well. Please keep this latter information (species within each ESA) for internal uses only since it provides more specific locations for some of our more sensitive / vulnerable species, such as the only occurrence in the state of a rare lily.

Metadata for all shapefiles is also included.

The only information that is missing is the species information that goes along with the Colonial Waterbird Colony locations. David Brinker has this information & perhaps it might be just as fast (if not faster) for you to ask him for that information directly if you need it right away.

I hope you find this information helpful for your planning process. Let me know if I can be of any further assistance.

Thanks,
lynn

Lynn Davidson
Conservation Technology Manager
MD DNR, Wildlife & Heritage Service
Natural Heritage Program
580 Taylor Ave, E-1
Annapolis, MD 21401
410-260-8563

---

**From:** Davidson, Lynn M.
**Sent:** Thursday, July 08, 2010 2:46 PM

**To:** 'carl_zimmerman@nps.gov'
**Subject:** Request from Trish Kicklighter

Carl,

Recently, Trish Kicklighter sent a letter to Glenn Therres (which he forwarded to me to handle) requesting a “current list of state candidate, proposed, or listed threatened and endangered species and any other special status species that occur in the vicinity of Assateague Island National Seashore, Maryland.” I am happy to send you this information, but I would like to know a little more about your definition of “in the vicinity”. For example, would this include islands and mudflats in the Coastal Bays that you may not own? Would this include any areas on the mainland portion of Worcester County beyond your property? If so, how far away? Would this include Assateague State Park? I’d appreciate receiving any clarification on your information request that you can provide.

I would have asked Trish these questions, but her letter ended with your name and email as the contact person for questions.

Thanks,
lynn

Lynn Davidson
Conservation Technology Manager
MD DNR, Wildlife & Heritage Service
Natural Heritage Program
580 Taylor Ave, E-1
Annapolis, MD 21401
410-260-8563

NHP Resources of AINS & vicinity.zip

Douglas W. Domenech
Secretary of Natural Resources

David A. Johnson
Director

# COMMONWEALTH of VIRGINIA

## DEPARTMENT OF CONSERVATION AND RECREATION

Division of Natural Heritage
217 Governor Street
Richmond, Virginia 23219-2010
(804) 786-7951

August 6, 2010

Trish Kicklighter
National Park Service
Assateague Island National Seashore
7206 National Seashore Lane
Berlin, MD 21811

Re: Assateague Island National Seashore General Management Plan

Dear Ms. Kicklighter:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

According to the information currently in our files, this site is located within the Assateague Island Conservation Site. Conservation sites are tools for representing key areas of the landscape that warrant further review for possible conservation action because of the natural heritage resources and habitat they support. Conservation sites are polygons built around one or more rare plant, animal, or natural community designed to include the element and, where possible, its associated habitat, and buffer or other adjacent land thought necessary for the element's conservation. Conservation sites are given a biodiversity significance ranking based on the rarity, quality, and number of element occurrences they contain; on a scale of 1-5, 1 being most significant. Assateague Island Conservation Site has been given a biodiversity significance ranking of B1, which represents a site of outstanding significance. The natural heritage resources within the project area are included in the attached Table 1: Assateague Island National Seashore General Management Plan – Natural Heritage Resources

DCR recommends avoidance of documented natural heritage resources including the mapped natural communities when planning for potential development. DCR also recommends contacting this office to request access to Natural Heritage digital data screening coverage for the Assateague Island National Seashore for use in planning and management of natural heritage resources. Please contact Rene' Hypes, Environmental Review Coordinator, at rene.hypes@dcr.virginia.gov or 804-371-2708 with your request.

Due to the legal status of the Loggerhead sea turtle, Piping plover, and Delmarva fox squirrel, DCR also recommends coordination with USFWS and VDGIF to ensure compliance with protected species

*State Parks • Soil and Water Conservation • Natural Heritage • Outdoor Recreation Planning*
*Chesapeake Bay Local Assistance • Dam Safety and Floodplain Management • Land Conservation*

legislation. Due to the legal status of the Peregrine falcon, Bald eagle, Gull-billed tern, Wilson's plover, , DCR also recommends coordination with VDGIF to ensure compliance with protected species legislation. Finally due to the legal status of the **Seabeach amaranth**, DCR recommends coordination with USFWS and VDACS to ensure compliance with protected species legislation.

Please note, additional global and state rare species and communities occurring within the project vicinity are listed in the attached Table 2 Natural Heritage Resources within 2 miles of Assateague Island National Seashore.

The Virginia Department of Agriculture and Consumer Services (VDACS), which has regulatory authority to conserve rare and endangered plant and insect species through the Virginia Endangered Plant and Insect Species Act, has established a Memorandum of Agreement with the Virginia Department of Conservation and Recreation (DCR). Under this Agreement DCR's Division of Natural Heritage, in consultation with VDACS, represents VDACS in its comments and recommendations regarding the potential impact of reviewed projects or activities on state-listed plant and insect species. Since it has been determined that this project or activity may impact **Seabeach amaranth**, a state rare plant, VDACS will respond directly to ensure compliance with Virginia's Endangered Plant and Insect Species Act. Further correspondence regarding the potential impacts of this project or activity on state-listed plant and insect species should be directed to VDACS.

Our files do not indicate the presence of any State Natural Area Preserves under DCR's jurisdiction occurring in the project vicinity.

New and updated information is continually added to Biotics. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

The Virginia Department of Game and Inland Fisheries maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from http://vafwis.org/fwis/ or contact Shirl Dressler at (804) 367-6913.

Should you have any questions or concerns, feel free to contact me at 804-692-0984. Thank you for the opportunity to comment on this project.

Sincerely,

Alli Baird

Alli Baird, LA, ASLA
Coastal Zone Locality Liaison

CC: Amy Ewing, VDGIF
Tylan Dean, USFWS
Keith Tignor, VDACS

# Table 1 - ASSATEAGUE ISLAND NATIONAL SEASHORE GENERAL MANAGEMENT PLAN- Natural Heritage Resources

| Group Name | Scientific Name | Common Name | Global Rank | State Rank | Federal Status | State Protected | FWS Species od Concern | Site Name |
|---|---|---|---|---|---|---|---|---|
| Vertebrate Animal | Falco peregrinus | Peregrine Falcon | G4 | S1B,S2N | | LT | | ASSATEAGUE ISLAND |
| Vascular Plant | Carex silicea | Sea-beach Sedge | G5 | S1 | | | | |
| Natural Community | Maritime Dune Woodland | Maritime Dune Woodland | G1G2 | SNR | | | | ASSATEAGUE ISLAND |
| Vascular Plant | Heliotropium curassavicum | Seaside Heliotrope | G5 | S1 | | | | ASSATEAGUE ISLAND |
| Natural Community | Interdune Pond | Interdune Pond | G1Q | SNR | | | | ASSATEAGUE ISLAND |
| Natural Community | Tidal Oligohaline Marsh | Tidal Oligohaline Marsh | G3 | SNR | | | | ASSATEAGUE ISLAND |
| Natural Community | Maritime Wet Grassland | Maritime Wet Grassland | G3 | SNR | | | | ASSATEAGUE ISLAND |
| Natural Community | Interdune Pond | Interdune Pond | G1Q | SNR | | | | ASSATEAGUE ISLAND |
| Natural Community | Maritime Dune Grassland | Maritime Dune Grassland | G2 | SNR | | | | ASSATEAGUE ISLAND |
| Natural Community | Maritime Wet Grassland | Maritime Wet Grassland | G1G2 | SNR | | | | ASSATEAGUE ISLAND |
| Vascular Plant | Vaccinium macrocarpon | Large Cranberry | G4 | S2 | | | | ASSATEAGUE ISLAND |
| Natural Community | Maritime Wet Grassland | Maritime Wet Grassland | G3 | SNR | | | | ASSATEAGUE ISLAND |
| Natural Community | Maritime Dune Woodland | Maritime Dune Woodland | G1G2 | SNR | | | | ASSATEAGUE ISLAND |
| Natural Community | Interdune Pond | Interdune Pond | G1Q | SNR | | | | ASSATEAGUE ISLAND |
| Vascular Plant | Plantago maritima var. juncoides | Seaside Plantain | G5T5 | S1 | | | | ASSATEAGUE ISLAND |
| Vertebrate Animal | Charadrius wilsonia | Wilson's Plover | G5 | S1B | | LE | | ASSATEAGUE ISLAND |
| Vascular Plant | Polygonum glaucum | Sea-beach Knotweed | G3 | S1S2 | | | | ASSATEAGUE ISLAND |
| Vertebrate Animal | Haliaeetus leucocephalus | Bald Eagle | G5 | S2S3B,S3N | | LT | | ASSATEAGUE ISLAND |
| Vertebrate Animal | Charadrius wilsonia | Wilson's Plover | G5 | S1B | | LE | | ASSATEAGUE ISLAND |
| Vascular Plant | Juncus megacephalus | Big-head Rush | G4G5 | S2 | | | | ASSATEAGUE ISLAND |
| Vascular Plant | Cyperus diandrus | Umbrella Flatsedge | G5 | S1 | | | | ASSATEAGUE ISLAND |
| Vascular Plant | Dichanthelium ovale var. ovale | Oval-fruited Panic Grass | G5T5 | S1? | | | | WILDCAT MARSH, ASSATEAGUE ISLAND |
| Vascular Plant | Chamaesyce bombensis | Southern Beach Spurge | G4G5 | S2 | | | | ASSATEAGUE ISLAND |
| Vascular Plant | Paspalum distichum | Joint Paspalum | G5 | S2 | | | | ASSATEAGUE ISLAND |
| Vascular Plant | Amaranthus pumilus | Seabeach Amaranth | G2 | S1 | LT | LT | | ASSATEAGUE ISLAND |
| Natural Community | Maritime Swamp Forest | Maritime Swamp Forest | G3 | SNR | | | | ASSATEAGUE ISLAND |
| Natural Community | Interdune Pond | Interdune Pond | G2G4 | SNR | | | | ASSATEAGUE ISLAND |
| Natural Community | Interdune Pond | Interdune Pond | G2G4 | SNR | | | | ASSATEAGUE ISLAND |
| Vascular Plant | Scleria verticillata | Whorled Nutrush | G5 | S2 | | | | ASSATEAGUE ISLAND |
| Vascular Plant | Chamaesyce bombensis | Southern Beach Spurge | G4G5 | S2 | | | | ASSATEAGUE ISLAND |
| Natural Community | Maritime Upland Forest | Maritime Upland Forest | G2 | SNR | | | | ASSATEAGUE ISLAND |
| Natural Community | Maritime Upland Forest | Maritime Upland Forest | G2 | SNR | | | | ASSATEAGUE ISLAND |
| Natural Community | Maritime Upland Forest | Maritime Upland Forest | G2 | SNR | | | | ASSATEAGUE ISLAND |
| Vascular Plant | Plantago maritima var. juncoides | Seaside Plantain | G5T5 | S1 | | | | |
| Vascular Plant | Polygonum glaucum | Sea-beach Knotweed | G3 | S1S2 | | | | |
| Vertebrate Animal | Caretta caretta | Loggerhead (Sea Turtle) | G3 | S1B,S1N | LT,PE | LT | | |
| Vascular Plant | Cuscuta polygonorum | Smartweed Dodder | G5 | S2? | | | | ASSATEAGUE ISLAND |
| Vascular Plant | Cyperus diandrus | Umbrella Flatsedge | G5 | S1 | | | | ASSATEAGUE ISLAND |
| Natural Community | Maritime Wet Grassland | Maritime Wet Grassland | G1G2 | SNR | | | | ASSATEAGUE ISLAND |
| Natural Community | Interdune Pond | Interdune Pond | G1Q | SNR | | | | ASSATEAGUE ISLAND |
| Natural Community | Maritime Dune Woodland | Maritime Dune Woodland | G1G2 | SNR | | | | ASSATEAGUE ISLAND |
| Vascular Plant | Heliotropium curassavicum | Seaside Heliotrope | G5 | S1 | | | | |
| Vascular Plant | Amaranthus pumilus | Seabeach Amaranth | G2 | S1 | LT | LT | | |
| Vertebrate Animal | Charadrius melodus | Piping Plover | G3 | S2B,S1N | LT | LT | | ASSATEAGUE ISLAND |
| Vertebrate Animal | Sciurus niger cinereus | Delmarva Fox Squirrel | G5T3 | S1 | LE | LE | | |
| Invertebrate Animal | Cicindela lepida | Spectral Tiger Beetle | G3G4 | S1 | | | | ASSATEAGUE ISLAND |
| Vascular Plant | Amaranthus pumilus | Seabeach Amaranth | G2 | S1 | LT | LT | | |
| Vascular Plant | Dichanthelium caerulescens | Blue Witch Grass | G2G3 | S1 | | | SOC | ASSATEAGUE ISLAND |
| | | | | | | | | |
| Site Name | Biodiversity Rank | Legal Status | | | | | | |
| ASSATEAGUE ISLAND | B1 | FL | | | | | | |

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Prepared by DCR-DNH. 8/6/2010

# Table 2 -Natural Heritage Resources within a 2 mile Radius of Assateague Island National Seashore

| Group Name | Scientific Name | Common Name | Global Rank | State Rank | Federal Status | State Protection | FWS Species of Concern | Site Name |
|---|---|---|---|---|---|---|---|---|
| Vertebrate Animal | Falco peregrinus | Peregrine Falcon | G4 | S1B,S2N | | LT | | ASSATEAGUE ISLAND |
| Vascular Plant | Carex silicea | Sea-beach Sedge | G5 | S1 | | | | |
| Natural Community | Maritime Dune Woodland | Maritime Dune Woodland | G1G2 | SNR | | | | ASSATEAGUE ISLAND |
| Vascular Plant | Plantago maritima var. juncoides | Seaside Plantain | G5T5 | S1 | | | | NORTH WALLOPS ISLAND |
| Vertebrate Animal | Egretta thula | Snowy Egret | G5 | S2B,S3N | | | | |
| Vascular Plant | Heliotropium curassavicum | Seaside Heliotrope | G5 | S1 | | | | ASSATEAGUE ISLAND |
| Natural Community | Interdune Pond | Interdune Pond | G3 | SNR | | | | NORTH WALLOPS ISLAND |
| Vertebrate Animal | Haliaeetus leucocephalus | Bald Eagle | G5 | S2S3B,S3N | | LT | | WILDCAT MARSH |
| Natural Community | Interdune Pond | Interdune Pond | G1Q | SNR | | | | ASSATEAGUE ISLAND |
| Natural Community | Tidal Oligohaline Marsh | Tidal Oligohaline Marsh | G3 | SNR | | | | ASSATEAGUE ISLAND |
| Natural Community | Maritime Dune Woodland | Maritime Dune Woodland | G1G2 | SNR | | | | NORTH WALLOPS ISLAND |
| Vertebrate Animal | Falco peregrinus | Peregrine Falcon | G4 | S1B,S2N | | LT | | NORTH WALLOPS ISLAND |
| Vertebrate Animal | Gelochelidon nilotica | Gull-billed Tern | G5 | S2B | | LT | | |
| Vertebrate Animal | Circus cyaneus | Northern Harrier | G5 | S1S2B,S3N | | SC | | WALLOPS ISLAND CAUSEWAY MARSHES, NORTH WALLOPS ISLAND, ASSAWOMAN ISLAND |
| Natural Community | Maritime Wet Grassland | Maritime Wet Grassland | G3 | SNR | | | | ASSATEAGUE ISLAND |
| Animal Assemblage | Bird Nesting Colony | | G5 | SNR | | | | |
| Natural Community | Interdune Pond | Interdune Pond | G1Q | SNR | | | | ASSATEAGUE ISLAND |
| Vertebrate Animal | Ardea alba | Great Egret | G5 | S2S3B,S3N | | SC | | |
| Animal Assemblage | Bird Nesting Colony | | G5 | SNR | | | | |
| Natural Community | Maritime Dune Grassland | Maritime Dune Grassland | G2 | SNR | | | | ASSATEAGUE ISLAND |
| Natural Community | Maritime Wet Grassland | Maritime Wet Grassland | G1G2 | SNR | | | | ASSATEAGUE ISLAND |
| Vascular Plant | Vaccinium macrocarpon | Large Cranberry | G4 | S2 | | | | ASSATEAGUE ISLAND |
| Natural Community | Tidal Mesohaline / Polyhaline Marsh | Tidal Mesohaline / Polyhaline Marsh | G4G5 | SNR | | | | NORTH WALLOPS ISLAND |
| Natural Community | Maritime Dune Scrub | Maritime Dune Scrub | G2 | SNR | | | | NORTH WALLOPS ISLAND |
| Natural Community | Maritime Dune Grassland | Maritime Dune Grassland | G2 | SNR | | | | NORTH WALLOPS ISLAND |
| Vascular Plant | Juncus megacephalus | Big-head Rush | G4G5 | S2 | | | | NORTH WALLOPS ISLAND |
| Vascular Plant | Chamaesyce bombensis | Southern Beach Spurge | G4G5 | S2 | | | | NORTH WALLOPS ISLAND |
| Natural Community | Maritime Wet Grassland | Maritime Wet Grassland | G3 | SNR | | | | ASSATEAGUE ISLAND |
| Natural Community | Maritime Dune Woodland | Maritime Dune Woodland | G1G2 | SNR | | | | ASSATEAGUE ISLAND |
| Natural Community | Interdune Pond | Interdune Pond | G1Q | SNR | | | | ASSATEAGUE ISLAND |
| Vascular Plant | Plantago maritima var. juncoides | Seaside Plantain | G5T5 | S1 | | | | ASSATEAGUE ISLAND |
| Vertebrate Animal | Charadrius wilsonia | Wilson's Plover | G5 | S1B | | LE | | ASSATEAGUE ISLAND |
| Vascular Plant | Polygonum glaucum | Sea-beach Knotweed | G3 | S1S2 | | | | ASSATEAGUE ISLAND |
| Vertebrate Animal | Haliaeetus leucocephalus | Bald Eagle | G5 | S2S3B,S3N | | LT | | ASSATEAGUE ISLAND |
| Vertebrate Animal | Charadrius wilsonia | Wilson's Plover | G5 | S1B | | LE | | ASSATEAGUE ISLAND |
| Vascular Plant | Juncus megacephalus | Big-head Rush | G4G5 | S2 | | | | ASSATEAGUE ISLAND |
| Vascular Plant | Cyperus diandrus | Umbrella Flatsedge | G5 | S1 | | | | ASSATEAGUE ISLAND |
| Vascular Plant | Dichanthelium ovale var. ovale | Oval-fruited Panic Grass | G5T5 | S1? | | | | WILDCAT MARSH, ASSATEAGUE ISLAND |
| Vascular Plant | Chamaesyce bombensis | Southern Beach Spurge | G4G5 | S2 | | | | ASSATEAGUE ISLAND |
| Vascular Plant | Paspalum distichum | Joint Paspalum | G5 | S2 | | | | ASSATEAGUE ISLAND |
| Vascular Plant | Amaranthus pumilus | Seabeach Amaranth | G2 | S1 | LT | LT | | ASSATEAGUE ISLAND |
| Natural Community | Maritime Swamp Forest | Maritime Swamp Forest | G3 | SNR | | | | ASSATEAGUE ISLAND |
| Natural Community | Interdune Pond | Interdune Pond | G2G4 | SNR | | | | ASSATEAGUE ISLAND |
| Natural Community | Interdune Pond | Interdune Pond | G2G4 | SNR | | | | ASSATEAGUE ISLAND |
| Vascular Plant | Scleria verticillata | Whorled Nutrush | G5 | S2 | | | | ASSATEAGUE ISLAND |
| Vascular Plant | Chamaesyce bombensis | Southern Beach Spurge | G4G5 | S2 | | | | ASSATEAGUE ISLAND |
| Natural Community | Maritime Upland Forest | Maritime Upland Forest | G2 | SNR | | | | ASSATEAGUE ISLAND |
| Natural Community | Maritime Upland Forest | Maritime Upland Forest | G2 | SNR | | | | ASSATEAGUE ISLAND |
| Natural Community | Maritime Upland Forest | Maritime Upland Forest | G2 | SNR | | | | ASSATEAGUE ISLAND |
| Vascular Plant | Plantago maritima var. juncoides | Seaside Plantain | G5T5 | S1 | | | | |
| Vascular Plant | Polygonum glaucum | Sea-beach Knotweed | G3 | S1S2 | | | | |
| Vertebrate Animal | Caretta caretta | Loggerhead (Sea Turtle) | G3 | S1B,S1N | LT,PE | LT | | |
| Vertebrate Animal | Caretta caretta | Loggerhead (Sea Turtle) | G3 | S1B,S1N | LT,PE | LT | | |
| Vascular Plant | Cuscuta polygonorum | Smartweed Dodder | G5 | S2? | | | | ASSATEAGUE ISLAND |
| Vascular Plant | Cyperus diandrus | Umbrella Flatsedge | G5 | S1 | | | | ASSATEAGUE ISLAND |
| Natural Community | Maritime Wet Grassland | Maritime Wet Grassland | G1G2 | SNR | | | | ASSATEAGUE ISLAND |
| Vertebrate Animal | Hydroprogne caspia | Caspian Tern | G5 | S1B,S2N | | SC | | |
| Natural Community | Interdune Pond | Interdune Pond | G1Q | SNR | | | | ASSATEAGUE ISLAND |
| Natural Community | Maritime Dune Woodland | Maritime Dune Woodland | G1G2 | SNR | | | | ASSATEAGUE ISLAND |
| Vascular Plant | Heliotropium curassavicum | Seaside Heliotrope | G5 | S1 | | | | |
| Vertebrate Animal | Rynchops niger | Black Skimmer | G5 | S2B,S1N | | | | WIRE NARROWS MARSH |
| Vertebrate Animal | Himantopus mexicanus | Black-necked Stilt | G5 | S1B | | | | WIRE NARROWS MARSH |
| Vertebrate Animal | Egretta tricolor | Tricolored Heron | G5 | S2B,S3N | | SC | | WIRE NARROWS MARSH |
| Vertebrate Animal | Egretta thula | Snowy Egret | G5 | S2B,S3N | | | | WIRE NARROWS MARSH |
| Vascular Plant | Amaranthus pumilus | Seabeach Amaranth | G2 | S1 | LT | LT | | |

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Prepared by DCR_DNH 8/6/2010

## Table 2 -Natural Heritage Resources within a 2 mile Radius of Assateague Island National Seashore

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Vertebrate Animal | Charadrius melodus | Piping Plover | G3 | S2B,S1N | LT | LT | | ASSATEAGUE ISLAND |
| Vertebrate Animal | Sciurus niger cinereus | Delmarva Fox Squirrel | G5T3 | S1 | LE | LE | | |
| Invertebrate Animal | Cicindela lepida | Spectral Tiger Beetle | G3G4 | S1 | | | | ASSATEAGUE ISLAND |
| Vascular Plant | Amaranthus pumilus | Seabeach Amaranth | G2 | S1 | LT | LT | | |
| Vascular Plant | Dichanthelium caerulescens | Blue Witch Grass | G2G3 | S1 | | | SOC | ASSATEAGUE ISLAND |
| Vertebrate Animal | Charadrius melodus | Piping Plover | G3 | S2B,S1N | LT | LT | | NORTH WALLOPS ISLAND |
| | | | | | | | | |
| **Site Name** | **Biodiversity Rank** | **Legal Status** | | | | | | |
| WIRE NARROWS MARSH | B5 | NL | | | | | | |
| NORTH WALLOPS ISLAND | B2 | FL | | | | | | |
| ASSATEAGUE ISLAND | B1 | FL | | | | | | |
| WILDCAT MARSH | B4 | SL | | | | | | |

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Prepared by DCR_DNH: 8/6/2010

"Ewing, Amy (DGIF)" <Amy.Ewing@dgif.virginia.gov>

07/29/2010 10:14 AM

To <carl_zimmerman@nps.gov>

cc "Boettcher, Ruth (DGIF)" <Ruth.Boettcher@dgif.virginia.gov>

bcc

Subject ESSLog# 31030_General Mgt Plan (GMP), Assateague Island National Seashore

We are writing in response to your request for information about listed wildlife species known to occur on and/or near Assateague Island National Seashore in Virginia for consideration during the development of a new management plan for the seashore.

According to our records, the following listed species under our jurisdiction are known from the general area:
federal Endangered Delmarva Peninsula fox squirrels, federal Threatened loggerhead sea turtles, federal Threatened piping plovers, state Threatened peregrine falcons, and state Threatened gull-billed terns.
We also note, as indicated in your letter, that state Threatened bald eagles are known from the vicinity.

We document the following Species of Greatest Conservation Need, as defined in Virginia's Wildlife Action Plan (www.bewildvirginia.org), from the general area: diamond-backed terrapin, little blue heron, sharp-tailed saltmarsh sparrow, and tri-colored heron.

Some of the records which document the above-mentioned species are historic in nature, represent stranding records (sea turtle), and/or were provided to us by biologists on Chincoteague National Wildlife refuge and do not necessarily represent known nesting areas on Assateague Island National Seashore. We recommend that the GMP/EIS address protection and management of the above-mentioned species and the habitats upon which they depend. We recommend coordination with Ruther Boettcher, VDGIF Eastern Shore Biologist, regarding the GMP/EIS and to ensure you have the most up to date data for the Virginia portion of the seashore. She may be contacted at 757-787-5911 or at Ruth.Boettcher@dgif.virginia.gov.

Thank you.

Amy

Amy M. Ewing
Environmental Services Biologist
Virginia Dept. of Game and Inland Fisheries
804-367-2211

2010 JUL 9 PM 12 47

# COMMONWEALTH of VIRGINIA

*DEPARTMENT OF ENVIRONMENTAL QUALITY*
*Street address:* 629 East Main Street, Richmond, Virginia 23219
*Mailing address:* P.O. Box 1105, Richmond, Virginia 23218
TDD (804) 698-4021
www.deq.virginia.gov

Douglas W. Domenech
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4000
1-800-592-5482

July 7, 2010

Ms. Trish Kicklighter
National Park Service
Assateague Island National Seashore
7206 National Seashore Lane
Berlin, Maryland 21811

RE: Request for Scoping Comments for the Preparation of a General Management Plan and an Environmental Impact Statement for Assateague Island National Seashore, Accomack County, Virginia and Worcester County, Maryland.

Dear Ms. Kicklighter:

This is in response to your June 21, 2010 letter (received June 24, 2010) announcing the preparation of a General Management Plan (GMP) and an Environmental Impact Statement (EIS) for the Assateague Island National Seashore in Accomack County, Virginia and Worcester County, Maryland, and soliciting comments on the scope of the documents.

## PROJECT DESCRIPTION

According to your letter, the GMP will provide National Park Service managers a comprehensive planning framework for managing the park over the next fifteen to twenty years. The plan will identify strategies for achieving desired resource conditions, visitor experiences, and the appropriate types and locations of potential future development. The combined GMP/EIS will identify management issues and concerns, present a reasonable range of management alternatives for addressing these issues, and will analyze the environmental impact of each alternative on natural and cultural resources and other impact topics.

## ENVIRONMENTAL REVIEW

The roles of the Virginia Department of Environmental Quality (DEQ) in relation to the proposed action are as follows. First, DEQ's Office of Environmental Impact Review will

coordinate Virginia's review of any environmental documents prepared pursuant to the National Environmental Policy Act (NEPA) and comment to NPS on behalf of the Commonwealth. A similar review process will pertain to the Federal Consistency Determination (FCD) that must be provided pursuant to the Coastal Zone Management Act (CZMA). If the FCD is included as part of the EIS, there can be a single review.

## FEDERAL CONSISTENCY UNDER THE COASTAL ZONE MANAGEMENT ACT

Pursuant to the Coastal Zone Management Act of 1972, as amended, federal activities affecting Virginia's coastal resources or coastal uses must be consistent with the Virginia Coastal Zone Management Program (VCP) (previously called the Virginia Coastal Resources Management Program) (see section 307(c)(1) of the Act and the *Federal Consistency Regulations*, 15 CFR Part 930, sub-part C). The National Park Service must provide a consistency determination which involves an analysis of the activities in light of the enforceable policies of the VCP (first enclosure), and a commitment to comply with the enforceable policies. In addition, we invite your attention to the advisory policies of the VCP (second enclosure). The FCD may be provided as part of the NEPA document or independently, depending on your agency's preference; we recommend, in the interests of efficiency for all concerned, that it be provided together with the NEPA document and that 60 days be allowed for review in keeping with the *Federal Consistency Regulations* (see section 930.41(a)). Section 930.39 of the *Federal Consistency Regulations* and Virginia's *Federal Consistency Information Package* at http://www.deq.virginia.gov/eir/federal.html give content requirements for the consistency determination.

## PROJECT SCOPING

While this Office does not participate in scoping efforts beyond the advice given herein, other agencies are free to provide scoping comments concerning the preparation of the NEPA document for the proposed project. Therefore, we are sharing your letter (attached) with selected state and local Virginia agencies, which are likely to include the following (note: starred (*) agencies administer one or more of the enforceable policies of the Virginia Coastal Zone Management Program):

- Department of Environmental Quality:
  - Office of Environmental Impact Review
  - Tidewater Regional Office*
  - Air Division*
  - Waste Division
- Department of Game and Inland Fisheries*
- Department of Conservation and Recreation:
  - Division of Soil and Water Conservation*
  - Division of Chesapeake Bay Local Assistance*
  - Division of Planning and Recreation Resources
- Marine Resources Commission*
- Department of Agriculture and Consumer Services

- Department of Health*
- Department of Mines, Minerals, and Energy
- Department of Historic Resources
- Virginia Institute of Marine Science
- Accomack-Northampton Planning District Commission
- Accomack County.

In order to ensure an effective coordinated review of the EIS and FCD, we will require 18 copies of the document when it is published. The submission may include 4 hard copies and 14 CDs or 4 hard copies and an electronic copy available for download at a National Park Service web or ftp site. The document should include a U.S. Geological Survey topographic map as part of its information. We recommend, as well, that project details unfamiliar to people outside the NPS be adequately described.

If you have questions about the environmental review process or the federal consistency review process, please feel free to call me at (804) 698-4325 or John Fisher of this Office at (804) 698-4339.

I hope this information is helpful to you.

Sincerely,

Ellie L. Irons, Manager
Office of Environmental Impact Review

Attachments

Ec: Cindy Keltner, DEQ-TRO
Kotur S. Narasimhan, DEQ-Air
Paul Kohler, DEQ-Waste
Amy Ewing, DGIF
Robbie Rhur, DCR
Pam Mason, VIMS
Tony Watkinson, MRC
Barry Matthews, VDH
David Spears, DMME
Keith Tignor, VDACS
Roger Kirchen, DHR
Elaine Meil, Accomack-Northampton PDC
Steven Minor, Accomack County

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
55 Great Republic Drive
Gloucester, MA 01930-2276

JUL 22 2010

Trish Kicklighter
US Department of the Interior
National Park Service
Assateague Island National Seashore
7206 National Seashore Lane
Berlin, Maryland 21811

Re: New General Management Plan, Assateague Island National Seashore

Dear Ms. Kicklighter,

This is in response to your letter dated June 21, 2010 regarding the National Park Service's (NPS) preparation of a general management plan (GMP) and accompanying Environmental Impact Statement (EIS) for Assateague Island National Seashore, located in Maryland and Virginia. When completed, the GMP will provide NPS managers a comprehensive planning framework for managing the park over the next fifteen to twenty years. Your letter requested a current list of candidate, proposed and listed threatened or endangered species under the jurisdiction of NOAA's National Marine Fisheries Service (NMFS) that occur in the vicinity of Assateague Island National Seashore.

*NMFS Listed Species near Assateague Island*
Several threatened and endangered species under the jurisdiction of NMFS can be found seasonally off the coast of Maryland and Virginia and may be present off the coast of the Assateague Island National Seashore. Listed whales, including endangered North Atlantic right whales (*Eubalaena glacialis*), humpback whales (*Megaptera novaeangliae*), and fin whales (*Balaenoptera physalus*) may be present in the area offshore of Assateague Island.

Several species of sea turtles are known to be present in the waters off of Assateague Island between April and November each year. Loggerhead (*Caretta caretta*), Kemp's ridley (*Lepidochelys kempi*), and green (*Chelonia mydas*) sea turtles may occur in nearshore coastal waters while foraging. Leatherback sea turtles (*Dermochelys coriacea*) are predominantly pelagic but also occur seasonally off the coast of Assateague Island.

*Technical Assistance for Candidate Species*
Candidate species are those petitioned species that are actively being considered for listing as endangered or threatened under the ESA, as well as those species for which NMFS has initiated an ESA status review that it has announced in the *Federal Register*.

Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) are distributed along the entire East Coast of the United States and have been designated a Candidate Species by NMFS. The best available

scientific information indicates that Atlantic sturgeon occur off the coast of the Assateague Island National Seashore. In 2006, NMFS initiated a status review for Atlantic sturgeon to determine if listing as threatened or endangered under the ESA is warranted. The Status Review Report was published on February 23, 2007. NMFS is currently considering the information presented in the Status Review Report to determine if any listing action pursuant to the ESA is warranted at this time. If it is determined that listing is warranted, a final rule listing the species could be published within a year from the date of publication of the proposed rule. Currently, NMFS expects to publish a finding as to whether any listing action is appropriate by the Fall of 2010. As a candidate species, Atlantic sturgeon receive no substantive or procedural protection under the ESA; however, NMFS recommends that Federal agencies consider implementing conservation actions to limit the potential for adverse effects on Atlantic sturgeon from any proposed action. Please note that once a species is proposed for listing the conference provisions of the ESA apply (see 50 CFR 402.10). As the listing status for this species may change, NMFS recommends that NPS obtain updated status information from NMFS prior to the completion of any NEPA documentation.

Thank you for the opportunity to provide information for inclusion in the EIS. Should you have any questions about these comments or about the section 7 consultation process in general, please contact Julie Crocker at (978)282-8480 or by e-mail (Julie.Crocker@noaa.gov).

Sincerely,

Mary A. Colligan
Assistant Regional Administrator
for Protected Resources

EC: Crocker, F/NER3
O'Brien, F/NER4

File Code: Sec 7 tech assist 2010

JUL 2 2012 PM 1:22

MDP

Maryland Department of Planning
Maryland Historical Trust

Martin O'Malley
Governor

Anthony G. Brown
Lt. Governor

Richard Eberhart Hall
Secretary

Matthew J. Power
Deputy Secretary

June 29, 2012

Carl S. Zimmerman
Assateague Island National Seashore
National Park Service
7206 National Seashore Lane
Berlin, MD 21811

Re: Hunting Camps and Related Properties
Assateague Island National Seashore
Worcester County, Maryland
Section 106 \ Review for Effects on Historic Properties

Dear Mr. Zimmerman:

Thank you for providing the Maryland Historical Trust (MHT) with additional information related to the planned disposition of nine former hunting camps and related properties within Assateague Island National Seashore. As the State Historic Preservation Office, MHT reviews all federal undertakings in Maryland and comments about their possible effects on historic properties pursuant to Section 106 of the National Historic Preservation Act.

In our January 30, 2012 letter MHT recommended that the nine subject properties be evaluated with Determination of Eligibility (DOE) forms to establish if they are eligible for listing in the National Register of Historic Places. We received the DOE forms with your April 9, 2012 letter. The forms built upon prior contextual research about hunting camps and related properties at Assateague and were well researched and written. They have been permanently added to the Maryland Inventory of Historic Properties for the benefit of future researchers.

Based on the information in the forms, we agree with the National Park Service (NPS) that Green Run Lodge (WO-581) is eligible for listing in the National Register and that the other properties are not eligible. Removal of the eight ineligible complexes will have "no effect" on historic properties and does not require any additional consultation with MHT. We look forward to consultation with the NPS regarding any future undertakings affecting Green Run Lodge.

Thank you for providing us this opportunity to comment. If you have questions or require assistance, please contact Jonathan Sager (regarding historic buildings and landscapes) at 410-514-7636 / jsager@mdp.state.md.us or Beth Cole (regarding archeology) at 410-514-7631 / bcole@mdp.state.md.us.

Sincerely,

Elizabeth Hughes for

J. Rodney Little
Director \ State Historic Preservation Officer

JRL\EJCUES
201201771

100 Community Place . Crownsville, Maryland 21032-2023
Telephone: 410.514.7600 . Fax: 410.987.4071 . Toll Free: 1.800.756.0119 . TTY Users: Maryland Relay
Internet: http://mht.maryland.gov

**United States Department of the Interior**

FISH AND WILDLIFE SERVICE
Chesapeake Bay Field Office
177 Admiral Cochrane Drive
Annapolis, MD 21401
410/573-4575

JUL 30 2012 PM 2:09

July 25, 2012

Trish Kicklighter
Superintendent
Assateague Island National Seashore
7206 National Seashore Lane
Berlin, MD 21811

*RE: Commencement of a new General Management Plan, Assateague Island National Seashore*

Dear Ms. Kicklighter:

This is an updated response to your letter, received June 22, 2010, requesting information on the presence of species which are federally listed or proposed for listing as endangered or threatened within the above referenced project area. We have reviewed the information you enclosed and are providing comments in accordance with section 7 of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*).

Two federally listed threatened species, the piping plover (*Charadrius melodus*) and the seabeach amaranth (*Amaranthus pumilis*) occur on Assateague Island National Seashore.

Piping plovers nest above the high tide line on coastal beaches, sandflats at the ends of sandspits and barrier islands, gently sloping foredunes, blowout areas behind primary dunes, sparsely vegetated dunes, and washover areas cut into or between dunes. Feeding areas include intertidal portions of ocean beaches, washover areas, mudflats, sandflats, wrack lines, and shorelines of coastal ponds, lagoons, or salt marshes. The seabeach amaranth grows in the same habitat types used by piping plover for nesting.

Potential impacts on piping plover and seabeach amaranth habitat should be analyzed as a part of your environmental assessment. If such impacts may occur, further section 7 consultation with the U.S. Fish and Wildlife Service may be required.

Except for occasional transient individuals, no other federally proposed or listed endangered or threatened species are known to exist within the project impact area. Should project plans change, or if additional information on the distribution of listed or proposed species becomes available, this determination may be reconsidered.

This response relates only to federally protected threatened or endangered species under our jurisdiction. For information on the presence of other rare species, you should contact Lori Byrne of the Maryland Wildlife and Heritage Program at (410) 260-8573.

Effective August 8, 2007, under the authority of the Endangered Species Act of 1973, as amended, the U.S. Fish and Wildlife Service (Service) removed (delisted) the bald eagle in the lower 48 States of the United States from the Federal List of Endangered and Threatened Wildlife. However, the bald eagle is still protected by the Bald and Golden Eagle Protection Act, Lacey Act and the Migratory Bird Treaty Act. If your project may cause "disturbance" to the bald eagle, please consult the "National Bald Eagle Management Guidelines" dated May 2007.

If any planned or ongoing activities cannot be conducted in compliance with the National Bald Eagle Management Guidelines (Eagle Management Guidelines), please contact Craig Koppie at 410-573-4534 for technical assistance. The Eagle Management Guidelines can be found at: **http://www.fws.gov/migratorybirds/issues/BaldEagle/NationalBaldEagleManagementGuidelines.pdf**.

We appreciate the opportunity to provide information relative to fish and wildlife issues, and thank you for your interest in these resources. If you have any questions or need further assistance, please contact Andy Moser at (410) 573-4537.

Sincerely,

For Genevieve LaRouche
Field Supervisor

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Appendix D

# Summary of Public Involvement Activities

## Table of Contents

GMP Scoping Summary Report 2009 ..... D-1

GMP Planning Update and Summary Report –
Preliminary Management Alternatives Public Review, January 2012 ..... D-14

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# Assateague Island National Seashore
# General Management Plan Scoping Summary Report
# 2009

**Introduction**

The National Park Service has begun the scoping process for the Assateague Island National Seashore General Management Plan/Environmental Impact Statement as required pursuant to the National Environmental Policy Act (NEPA). Scoping is a process that begins early in the development of a General Management Plan (GMP) for all units of the National Park System, and continues throughout the planning process. Scoping is conducted both internally by National Park Service planning teams and externally with the public including partners, local governments, other interested parties, and the general public. A Notice of Intent was published in the Federal Register at the beginning of the scoping process to invite comment and participation. This report describes the public involvement activities that NPS has completed thus far for the Assateague Island National Seashore GMP, and summarizes the comments and ideas that have been raised by the public.

**Scoping with the General Public**

NPS hosted a series of three open house workshops and eight outdoor information stations to solicit public input regarding the issues that should be addressed in the GMP, as well as ideas, opportunities, and concerns for the future of the park. In advance of the meetings, NPS staff issued a press release to several media sources, emailed meeting announcements to the seashore email list, and distributed the first GMP newsletter.

The first newsletter issued in summer 2009 described the Assateague Island National Seashore's GMP process. The newsletter invited the public to provide ideas and comments for the planning process, and posed a series of questions that asked people their opinions on what is most special to them about the park; their concerns for the park's future; thoughts on recreational and educational opportunities that should be available to visitors; how to better protect the natural environment and ecological values of the park; and how to make it easier to get onto and around the seashore. Prior to the public scoping meetings, the newsletter was sent out to the seashore mailing list and posted on the park's website.

During the open house workshops and outdoor information sessions, the public was introduced to the GMP process via information posters, the GMP newsletter, seashore maps, and through discussion with members of the planning team. The public was invited to fill out comment cards, provide comments directly on seashore maps, or write comments on large blank sheets of paper. Additionally, the public was invited to provide comments, ideas, and opportunities for the future of the seashore via email (ASIS_GMP@NPS.gov) and mail.

Open house workshops were held:

- The Wor-Wick Community College – September 21, 2009
- Paul Sarbanes Coastal Ecology Center – September 22, 2009
- Chincoteague Center Community Center – September 23, 2009

Outdoor GMP information sessions were held:

- July 11, 2009 in Maryland:
  - Old Ferry Landing
  - North Beach Parking Lot
- July 11, 2009 in Virginia:
  - Toms Cove Visitors Center
  - Toms Cove Parking Lot
- August 15, 2009 in Maryland:
  - OSV Entrance Road
  - North Beach Parking Lot
- August 15, 2009 in Virginia:
  - Toms Cove Visitors Center
  - Toms Cove Parking Lot

**Comments Received on the NPS PEPC Web Site**

The NPS Planning, Environment and Public Comment (PEPC) website provides the public with an electronic link for obtaining information about or commenting on the GMP process. ighteen comments were received in 2009.

**Summary**

This report provides a summary of the public comments organized by topic, which were received so far as part of initial public scoping. Between the ideas generated through the comment cards, emails, letters, and other sources, the GMP team received hundreds of comments. These comments came in various forms, including comment cards (139), emails (44), letters (4), PEPC comments (18), comments written on seashore maps (32), and comments recorded at outdoor events (44).

## Question 1 – What is most special to you about Assateague Island National Seashore?

**Protection of the Seashore's Resources**

- Assateague Island contains the most extensive beach habitat in Maryland and is the state's premier breeding site for beach-nesting birds. Assateague Island has been recognized as an Important Bird Area (IBA) of global significance due to its nesting population of the Federally Threatened Piping Plover. Other beach-nesting birds of conservation priority at Assateague include Least Tern (Maryland State Threatened), Black Skimmer (Maryland State Endangered), American Oystercatcher, and Common Tern. Assateague Island serves as an important breeding location for several other vulnerable bird species including Common Nighthawk, Chuck-will's-widow, Seaside Sparrow, and Saltmarsh Sparrow. The island is consistently a significant migration corridor for Peregrine Falcon (Maryland At-risk Species) and a stopover location for a number of shorebird (e.g. Sanderling, Dunlin, Ruddy Turnstone, etc.) and seabird species (e.g. Forster's Tern, Common Tern, Black Skimmer, etc.). ASIS boasts a high diversity of the saltmarsh breeding bird assemblage with 7 of 16 possible saltmarsh species breeding regularly.

**Visitor Use and Visitor Experience**

- access to natural resources (ponies, wildlife) and recreational uses (fishing, birding, camping)
- access to natural resources in an undeveloped natural setting
- access to natural resources in an undeveloped natural setting, and recreational uses including OSV use, fishing, and swimming
- public beach, with one small access fee, no extra parking fee, and no invasion of noise or commercial activity
- recreational uses, related to hiking/biking but park routes are blocked due to parked cars Recreational uses, related to hunting, fishing, OSV, and water sports
- that the park belongs to the people, not the government
- Tom's Cove deck/trail, the Assateague Lighthouse, The Nature Circle
- clean
- history of the park
- ocean, beach, and the lighthouse
- open space
- park programs
- recreational uses, including clothing option area
- recreational uses, park programs and interpretation
- undeveloped natural setting, with some services
- views
- natural, dynamic nature of the park
- ocean, beach, with easy access
- enjoy many aspects
- family memories
- importance of preserving the park for future generations
- access to natural resources and park programs
- natural environment, preservation, wildlife/habitat
- ocean, beach

- natural environment
- wildlife (including birds and ponies) and habitat
- undeveloped natural setting
- ocean, beach, natural environment, and wildlife/habitat

**Visitor Use and Visitor Experience – Traffic, Circulation, and Access**

- additional handicapped parking is needed to improve access
- continue abundant parking at south end and increase area for parking
- driving on the beach provides access. We would be unable to walk over the dunes to access the beach otherwise.
- easy access
- parking lot for RVs only
- parking lots and access

## Question 2 – What are your concerns for the Seashore's future?

**Protection of the Seashore's Resources**

- threats which face both the nesting and migrating birds of ASIS include beach erosion, disturbance, predators, and sea level rise
- concern with the eradication of the sika deer, along with the traditions, heritage, opportunity, and income that go along with them
- external impacts to park, including development and off shore wind power
- preserving the park for future generations
- protection of natural resources
- reduction of horse herd

**Barrier Island Dynamics and Sea Level Rise**

- changes to the park due to natural processes and OSV use
- changes to the park due to natural processes, including sea level rise, erosion, weather damage, and dune loss
- the natural action of the barrier island will provide protection, not man-made dikes/dunes

**Visitor Use and Visitor Experience**

- enjoy many aspects of the park
- enjoy the store
- ensure a clothing optional beach
- horse and trash and pollution
- I don't want it to rain
- overuse and overcrowding

**Visitor Use and Visitor Experience – OSV**

- concerned that if the users and the park management don't work together there will be more closures and restrictions then there is now
- too crowded – extend the road and provide more beach access
- lifeguards for OSV zone
- restricting access of beach, wilderness designation
- loss of access to the beach/bays
- loss of access to the beach and bays – OSV access

**Visitor Use and Experience – Traffic and Circulation**

- additional parking, including the south beach
- parking (south end) and economy of Chincoteague
- traffic – shuttle service and limit the number of vehicles on the beach

**Partnerships**

- accommodation of all interests regarding a diversity of uses while respecting the natural environment
- support for partnerships with the development and agricultural community

**Facilities and Operations**

- funding for park programs
- funding shortfalls
- rules on campfires and alcohol
- safety and security
- safety and security, preservation of the park for future generations
- threat of development of additional park facilities and/or encroachment
- trash and pollution

**Miscellaneous**

- natural population growth will pressure the park
- too much government protection
- uncertain future
- visitor attitudes
- will the defense departments need for an inland waterway conflict with your plan
- changes to the park due to humans including hunting accidents and gang violence

### Question 3 – What recreational and educational opportunities do you think should be available to visitors at the Seashore?

**Visitor Use and Experience**

- doing well currently
- enjoy current food and beverage options
- enjoy current level of park programs, recreation, and/or education opportunities
- enjoy the park's natural resources, OSV area, and the park's management and staff
- enjoy the visitor center and park programs
- enjoy the written description of activities of wildlife visible from trails
- fishing, crabbing, hunting, beach combing, etc.
- nature based educational opportunities and recreational programs including fishing, OSV, camping, and water based activities
- ponies
- the new visitor center will provide additional opportunities

**Visitor Use and Experience – Education and Interpretation**

- additional programs geared towards children and expand programs to local schools
- additional special events, such as bon fire nights, meteor shower, or “beach seminars”
- consider offering history of the island courses, senior programs, photography classes, or ecology courses for user groups
- continued and increased education opportunities for visitors to learn about the significance of ASIS to beach-nesting birds, salt marsh-nesting bird and other wildlife – visitors should be made aware of current management and monitoring practices and how the public's use of Assateague impacts the island's ecosystem and distinctive birdlife

- crabbing and fishing lessons/education
- educate visitors on the effects of OSV use on beach-nesting birds and migrant shorebirds on the beach
- educational classes about keeping the beach clean
- educational opportunities should be better publicized
- educational opportunities should be offered year round and/or during the week
- greater detail of the history of the island and a pamphlet with GPS coordinates of the old hunting lodges, and houses
- increase interpretive program material on websites
- nature based educational opportunities
- recommend the creation of an educator position that would deliver programs and information to the public specifically related to beach-nesting birds at ASIS, including ecology, threats, monitoring and management

**Visitor Use and Visitor Experience – OSV**

- additional OSV access overall (with camping), and in Virginia
- general recreational opportunities that currently exist at the park, including non-mechanized, non-destructive e.g. No ORV's, personal high-speed watercraft
- OSV classes to teach beach maintenance, appropriate uses, and equipment
- when there are closures for birds, active fishermen should have a detour and use the back goad to go around the closure

**Visitor Use and Experience – Recreation**

- additional "put ins" for kayaking in the back bay
- additional water/land trails and preserved land
- all forms of hiking, birding and water activity like surfing, swimming, fishing, kayaking/canoeing, kite-surfing and sailing should be top priorities
- allow personal water craft access to a designated area that is separate from other recreational users of the park
- allow vehicles on beach overnight
- as is – no camping
- boat rentals and concerts
- continue current recreational opportunities, with restrictions on hunting
- do not take away any current recreation opportunities currently existing
- enjoy clothing optional areas that is designated and well signed
- establish clam and oyster beds along Assateague bay shoreline for recreational clamming
- expand recreational opportunities to year round
- general recreational opportunities that currently exist at the park
- more recreational based tour opportunities – ranger led walks; history, kayak, bike, boat, and bus tours
- quiet zones from radios, etc. – enjoy evening programs on the beach or in screened amphitheater
- request continued equal access for kite-boarding in the park – is a low impact activity that contributes revenue to the local economy
- request that an area/remote area of Assateague could be designated as clothing optional
- safely manageable recreational opportunities, swimming, fishing, etc. or those that have health benefits
- too many recreational users, especially OSV
- volleyball nets
- water based recreational programs, including sustainability

**Visitor Use and Experience – Traffic and Circulation**

- additional parking at south end
- reduce vehicle access in the park – for example, please close the wildlife loop to cars

**Partnerships**

- utilize volunteers to help promote recreation and education workshops

**Facilities and Operations**

- additional air pumps and dump stations
- additional food/drink opportunities
- beach front visitor center
- consider utilizing the plastic material on the parking lot next to the environmental center to maintain that road – would allow for wash-overs and still maintain the road integrity
- no additional park facilities
- provide full showers
- suggest larger visitor center with film viewing area

**Miscellaneous**

- unsure of additional opportunities

### Question 4 – How can we better protect the natural environment and ecological values of the Seashore?

**Protection of the Seashore's Resources**

- acquire additional neighboring lands
- adaptive management approaches, use NWR for resource projects
- additional vegetation
- attempt to prevent beach loss/erosion
- consider modifying plover management approach to allow visitors in the OSV area to drive around the closure areas
- control of invasive species
- control pollution
- different approach to the management of areas for nesting birds
- doing well currently
- erosion management
- establish mussel beds along the O.C. inlet rocks, the bivalves would help clean up the waters
- limit areas for crabbing/protect the mud flats for wildlife
- maintain the park's undeveloped natural environment and clean waters
- plant Sea Beach Amaranth out of OSV zone
- protect dunes and/or build dunes
- protection of surrounding waters
- reduce the pony heard
- south end snow fence, jetty, and dredging of sand to beach
- suggest that NPS should take a proactive approach to increase the numbers of Piping Plovers rather than restricting access to protect them
- supports the inclusion of the following bird management and monitoring practices in the updated general management plan:
  - determine and implement the best management practices for maintaining high-quality Piping Plover nesting habitat on ASIS, especially on the storm berm at the island's north end
  - quantitatively assess the effects of storm berm notches on Piping Plover reproductive success, and continue/change management accordingly
  - continue use of predator exclosures for Piping Plover nests
  - continue removal of mammalian and avian nest predators as necessary to prevent and mitigate Piping Plover nest failure due to depredation

  - continue rigorous monitoring of beach-nesting birds, including Piping Plover, Least Tern, and American Oystercatcher
  - quantitatively assess the effects of pony grazing on salt marsh habitat and salt marsh-nesting birds, including Saltmarsh Sparrow and Seaside Sparrow
  - maintain appropriate beach closures, including OSV zone, as necessary for nesting Piping Plovers. Use clearly marked signage and frequent public notification
  - explore the feasibility of creating suitable breeding conditions for Piping Plover through vegetation removal and artificial disturbance if the natural disturbance regime fails to maintain the plover population
  - determine the likely impacts of sea level rise on the island's beach and salt marsh habitats and their birdlife
  - develop and implement sea-level rise adaptation strategies for beach and salt marsh habitats

**Visitor Use and Visitor Experience**

- better education not to feed animals. Have back road open so vehicles will not be tempted to ride on dunes when high water
- extended hours for the visitors center
- protection through public education

**Visitor Use and Visitor Experience – OSV**

- continue to allow access for OSV
- extend the OSV road, but shrink the area so that it is open to the public
- if access to the park is so restricted, what purpose does it serve? becomes an educational resource
- limits on OSV, especially south end towards Tom's Cove Hook – consider alternate ways to get there including shuttle or walking
- limits on OSV
- maintain the vehicle count at 145
- no limits on the number of people who can access the island
- OSV safety course
- rethinking vehicle/ORV access

**Visitor Use and Visitor Experience – Traffic and Circulation**

- encourage carpooling
- limiting the number of people and cars who can access the park
- reduce vehicular traffic, encourage biking and/or shuttle buses
- traffic control

**Partnerships**

- consider developing a cooperative agreement with UMES, Perdue Chicken, Mt. Air Company to collect Piping Plover eggs and hatch them inside, then release
- education and outreach, lobby for additional funding
- outreach to local officials
- work with local groups like AMSA to ensure protection and conservation of this national resource

**Facilities and Operations**

- additional park facilities and park maintenance
- additional staffing
- additional trash/recycling bins and closer to the beach
- address northern end boat landing congestion
- cleaning facilities for campers
- enforcement of current park rules

- keep trash cleaned up
- limits on additional development in park
- make ranger patrols visible during high visitation hours
- no expansion of roads and/or parking lots
- open back road for OSV use to allow for access during bird nesting times
- prevent horse riding at south end
- prohibit fishing
- quit building bath houses and parking lots, board walks and blacktop roads
- relinquished much via the ORV zones and suppression of other activities in other parts of the park to compensate - places an unfair burden on ordinary park-and-walk visitors
- separate traffic of pony watchers, and others
- tickets for those who liter

**Miscellaneous**

- be proactive to save beaches
- bothered by wave riders
- by using common sense laws and encouraging people to be responsible
- judicious management and avoidance of over-zealous protective action
- keep the park as it is today
- keep the park open
- no smoking on beaches
- unsure

### Question 5 – How can we make it easier to get onto and around the Seashore?

**Protection of the Seashore's Resources**

- Assateague will be better preserved if the cars stopped before the sand packing
- believe there is a limit on how much capacity the park can handle – has begun to get overly crowded, and I can only imagine what that does to the water quality, not to mention the low-key atmosphere that was the park environment
- consider doing like other beaches and enclose areas for wildlife instead of closing entire beach to 4x4/walkers
- consider implementing the Florida Gulf Coast sea turtle program here
- do not eradicate the sika deer from the island, they bring enjoyment, visitor traffic, and cause less damage to the island than the ponies
- do not want the beach ruined by making dunes. Let the island be what it is
- fence the road to keep horses out and increase the speed limit
- keep it as "green" as possible, i.e. maintain natural habitats
- keep people off of dunes, use trails only
- reduce the pony herd size

**Visitor Use and Experience – Education and Interpretation**

- additional public education programs, not excessive "do not touch, do not trespass" signs

**Visitor Use and Visitor Experience – OSV**

- add annual permit to the OSV price
- additional OSV access by allowing for more vehicles on the beach (increasing the number of cars to 200) and/or by expanding the OSV zone
- improve the ORV access ramp
- inspect OSV to ensure proper waste disposal

- more parking, open the back road, shuttles, increase OSV carrying capacity, create/restore more OSV access ramps, establish routes around resource/safety closures, replace 2nd bullpen
- no change to the current OSV program. Utilize the OSV community to assist the park
- OSV driving course or instruction
- OSV passes should be available at the ranger station or ordered by phone or mail. Those who do not have proper equipment should lose their permit, forfeit on citation.
- OSV road must be constructed and maintained with a seashell base
- paths and a layer of parking area at the end of the road at the beginning of the OSV
- reopen the back road
- reopen the back road to allow access when weather or protection warrants a closure – consider allowing use of the dune crossings, OSV from Maryland to Virginia, and/or increase the vehicle limit
- reopen the back road, which would lighten the traffic on the beach – fine OSV users for littering and speeding
- too many restrictions of OSV use may reduce the fun
- support maintenance of current OSV zone openings and closures in accordance with locations of beach-nesting birds (i.e. Piping Plover) – do not support the opening of new areas to OSV use – encourage continued monitoring and research regarding the ecological impacts of OSV use on ASIS

**Visitor Use and Experience – Recreation**

- additional bike/hike trails - ramp for bikeway to north beach parking lot
- additional bike/hike trails
- designated sports areas
- disallow surf fishing with long lines for sharks, which is logically in conflict with children and other people being in the water
- expand bike trails and limit vehicular traffic by providing shuttles
- give surf fishermen an area so their lines are not amongst swimmers
- restore Swans Cove Trail
- link Black Duck Trail to beach
- provide safer bike trail from Chincoteague circle

**Visitor Use and Experience – Traffic and Circulation**

- a private ferry concessionary service, with reasonable hours and a regular schedule
- access seems to be easy, never had a problem, except in summer season but I understand that and adjust accordingly
- additional parking
- consider a series of small, 3- to 5-space parking areas along the main road to allow people to look out between the openings and get out to look at horses
- entrance way:
  - more booths at the park entrance
  - additional entrance
  - redesign the entrance way
  - open the annual pass lane sooner
  - auto pay for entrance fees
  - separate entrance for pass holders
- expand the historical exhibit parking between the main and south parking area and allow walkover onto the beach to relieve some of the pressure of the south beach area
- implement senior golden pass access thru self-swipe gate – build a third gate entry for daily/weekly visitor
- provide shuttle services, including town to beach and/or to off-road areas such as the mid-point of MD shore
- public transport to beaches near Wash Flats for a limited number of people per day, if birds aren't using the area that year

- signage:
  - signs to pull over to the shoulder if horse watching
  - additional signage – horse trailer areas
  - additional signage/wayfinding inside the park and to direct visitors to the park – signage on Rt 13, near Wallops, in Chincoteague, especially at drawbridge
  - additional signage within the park and on OSV route – will make it easier to report problems
- storm events could overburden a bus system
- support the addition of public transit to and from ASIS – an NPS shuttle service could prove more cost-effective than maintaining extensive repeatedly eroding parking areas on Assateague – locate parking areas on the mainland to reduce the amount of developed area on an Assateague Island which already has limited land

**Partnerships**

- utilize friends groups and other volunteers
- work with local, county, and state government to improve transportation

**Facilities and Operations**

- five-minute parking at campground office parking lot #1
- allow additional vehicles in the park
- allow for limited/permitted back country camping beyond the south parking
- better enforcement of leash laws
- better enforcement of no stopping for wildlife viewing
- better maintenance of the entry way
- do not make access any easier than it is today, would make it more crowded and/or ruin what is special about the park
- don't count campers in the bullpen towards to total number allowed on the beach
- eliminate entrance fees
- hook ups on RV sites
- increase the length of the boardwalk
- limit OSV permits to Maryland citizens only – reduce OSV fees, and the pony population to where they will no longer be a traffic hazard – eliminate roads, parking lots, boardwalks and bathhouses to reduce visitors and eliminate traffic
- longer staffing hours at the entrance way to ensure payment
- maintain road system and visitor center
- more benches near the showers in the changing rooms
- more dog friendly
- more parking and roadside pull off areas for viewing wildlife
- move bikeways to parallel Bayberry return from south end – Old Ferry Road, Bayside – move either E-station counter or North Beach parking lot – north exit
- provide hot water, flush toilets, and electricity in the park and the campsite
- public information:
  - develop a brochure that includes information about what is allowed and hours
  - on-line weekly newsletter and update with photos and annotation
  - provide maps at the entrance station
  - provide public information via call in number regarding beach closure and weather conditions
- rent golf cart type vehicles on the island
- shade areas around BBQ

## Public Comment – Emails, Letters, PEPC, Outdoor Information Session Comments, Map Comments, and Additional Comments from Comment Cards

**Protection of the Seashore's Resources**

- continue to ban all development from the seashore
- need more regulation of commercial fishing and dumping off our coastal waters – maybe a 25-mile limit for national park lands and natural preserves
- will the barrier island exists in 20 years? global warming

**Visitor Use and Visitor Experience**

- enjoy recreational activities at the park, including kites, fishing derbies, crabbing, fishing, skim boarding
- enjoy seeing wildlife and the natural environment
- enjoy the view, without encroachment of buildings
- enjoy time at the park
- no commercial interest – would wreck the island – leave it as is for the future visitors and our children
- preserve and increase access for surf fishing
- reconstruct a bike path that would connect the refuge with the Maryland side of Assateague Island and add several hike-in/canoe-in/bike-in campgrounds
- recreational opportunities = sika deer hunting, camping, exploration
- increase in the number of visitors to the park will destroy the pristine environment
- North Beach is getting more crowded with fishermen who ignore safely issues and fish in areas with swimmers
- is beautiful here – just needs a water area
- with eradication of sika deer would eliminate tradition (many generations)

**Visitor Use and Experience – Transportation and Circulation**

- add additional entrance lanes to reduce congestion and separate day users and campers
- appreciate easy access to the seashore
- beach access (in Swan's Cove area) is very popular, but we still need more cycle racks in summer
- electronic sign on 611 to alert visitors to beach closures, etc.
- encourage use of bike trail where available (perhaps better signage??)
- extend bike paths to beach (in Virginia)
- limit off road traffic along OSV route (in Toms Cove area)
- make gate easier to navigate/faster to get through – consider separating those that need to pay from those who have already paid
- more pony pull-offs
- no alternative transportation – ie - no cars – would destroy the economy of Chincoteague Island
- OSV ramp scheduled for ongoing upkeep and repair – ideally, a base of clam/oyster shells can be brought in to rebuild the ramp and a drainage pipe could also be incorporated into the plan for drainage
- parking lots can beyond capacity at times

**Visitor Use and Visitor Experience – Clothing Optional**

- a clothing optional area will increase tourism to the park and neighboring areas
- do not designate an area of Assateague for clothing optional
- inappropriate behavior is not tolerated at clothing optional beaches
- nudists are good citizens of the beaches we visit, and assist with beach clean-ups and bring
- polls indicate that a majority would support a nude area if proper signs informed the public where it is located
- providing a clothing optional area would only require the posting of several signs (to prevent inadvertent sightings), and would result in additional park visitors
- request that a clothing optional zone of the Maryland portion of Assateague be reinstated

- request that an area/remote area of Assateague could be designated as clothing optional
- the experience at Sandy Hook demonstrates that clothed and clothing optional beach uses can co-exist successfully
- we pay taxes and would like our tax dollars support our interest in a clothing optional beach

**Visitor Use and Visitor Experience – Education and Outreach**

- concerned that adequate consideration is given to the interpretation of the human aspects of the seashore; in particular the interpretation of the old Life-Saving Service station that was vital for the rescue of shipwrecked sailors along this very dangerous stretch of coast
- enjoy park programs, including ghost crab night and fishing derbies
- include OSV info in Junior Ranger curriculum
- park programs to feed into the Virginia Standards of Learning (SOL)
- professional four-wheel drive tour of beach island areas
- provide NPS brochure at entrance station
- tell visitors the role, and importance, of the men of the US Life Saving Service
- used to be evening talks on the beach in a screened enclosed amphitheater

**Visitor Use and Visitor Experience – OSV**

- consider charging a higher price for OSV permits and provide education/orientation regarding rules and OSV best practices
- continue ORV all season (in Toms Cove area) - rope off area with tape where nesting occurs
- day fee for OSV zone
- enjoy using the off-road portion of Assateague – believe that more damage happens to the island from visitors walking on the dunes than from allowing vehicles on the beach – should be additional educational programs and enforcement to stop this
- expand the OSV, unify the two sections of Assateague Island National Seashore
- increase OSV access
- no day fees in the OSV zone
- open the back road to allow for better access in the ORV zone
- OSV vehicle kit for sale at the ranger station - tow rope, boards, tire gauge, shovel, small first aid kit, fire extinguisher, flashlight
- stop cars from going on the beach – is inappropriate and totally wrong for Assateague
- suggest increasing the number of OSV users on the beach to 230, based on the formula of 100 ft. apart for 13 miles
- think that the OSV users are given additional privileges than other campers (they don't register, no limits for stays, make it difficult for others to access the beach driving area)

**Facilities and Operations**

- a group of volunteers would assist staff in maintaining, cleaning, and caring for the seashore
- additional showers
- concerned with the mess left behind ponies
- consider charging ocean side and weekend campers a higher rate
- day-use beach on the north end of the island, with a 1-mile access road from the end of 611 and parking - this area is currently used as state park camping
- disappointed that the new parking lot was installed without permeable pavers
- ensure there are adequate restrooms, including along in the OSV area
- keep NPS campgrounds managed by the NPS
- litter accumulates on the beach
- need an area for food/soft drinks
- never provide hot showers – will create health issues

- request more "no generator" areas, because they are very disruptive and so noisy
- state park camping should be moved to provide for additional beach front parking, with the collection booth moved to the end so that traffic does not block entrance to the national park
- upgrade restrooms

**Miscellaneous**

- add website to the senior pass
- annex Worcester County
- cheaper scooter rides
- enjoy current access and hope the park remains dog friendly
- ensure that the protection of the rights of the OSV permit holder be considered throughout the entire GMP process
- monitor those who do not protect the interests of the park
- park is great as it is
- too many dogs not on leashes
- unsure

# Assateague Island National Seashore
# General Management Plan Preliminary Management Alternatives Public Review
# January 2012

## Planning Update – National Park Service and Fish and Wildlife Service Planning Projects

Assateague Island is a 37-mile long barrier island located off the Atlantic coast of Maryland and Virginia. The island and its surrounding waters consist of three public areas; Assateague Island National Seashore (approximately 8,300 acres of lands and 32,200 acres of waters managed by the National Park Service (NPS)), Assateague State Park (600 acres managed by Maryland's Department of Natural Resources) and Chincoteague National Wildlife Refuge (8,900 acres in Virginia managed by the U.S. Fish and Wildlife Service (FWS)).

The NPS and FWS are both undertaking long-range planning efforts for those portions of the island over which they have management authority. Although the NPS and FWS have separate planning standards and directives reflecting the different missions of the two agencies, the general planning steps are similar in many respects. Both require that management plans identify the actions needed to accomplish the purposes for which the seashore or refuge was established by considering a full range of alternatives. Public involvement is required throughout the planning process and decisions are made in careful consideration of comments received from all interested parties. The plans must comply with the National Environmental Policy Act (NEPA) and other applicable requirements and as such are generally prepared in an environmental impact statement (EIS) format.

The NPS planning effort will produce a new General Management Plan (GMP) for Assateague Island National Seashore. The GMP will establish a vision for the seashore and provide guidance for its management over the next 15 to 25 years. In July 2011, the NPS GMP planning team released a GMP alternatives newsletter outlining several preliminary alternative management concepts for the future of the seashore and held a series of open house workshops.

The long-range planning effort by the FWS is developing a Comprehensive Conservation Plan (CCP) for the Chincoteague National Wildlife Refuge. The FWS CCP planning team released a CCP alternatives newsletter for the Refuge in August 2011 and also held a series of public workshops.

The planning teams for both agencies have gathered and analyzed the public comments. The NPS GMP planning team found that many of the comments received from the public addressed issues and concerns outside the scope of NPS authority. Most of those comments targeted elements of the proposed CCP alternatives for Chincoteague National Wildlife Refuge and will be forwarded to the FWS. Examples of issues and concerns that are beyond the scope of the NPS GMP include:

- shuttle service to the beach in Virginia
- potential economic impacts due to proposed changes in access in Virginia
- the Chincoteague National Wildlife Refuge pony herd
- beach replenishment and dune fortification in the Chincoteague National Wildlife Refuge

The following report outlines the NPS GMP management alternatives public review process and briefly summarizes the public comments on the Assateague Island National Seashore GMP.

## GMP Management Alternatives Public Review

The NPS presented four preliminary management alternative concepts for public review in the summer of 2011. The NPS mailed a GMP alternatives newsletter to over 500 addresses, emailed electronic newsletters to approximately 36 addresses, posted the newsletter on-line, and hand distributed an additional 950 newsletters at the NPS visitor centers and at public meetings. The newsletter provided a summary of the four management alternatives and associated zoning, as well as an update on the planning process, the foundation for planning, a summary of scoping comments, and the planning considerations. The newsletter also invited the public to attend

public open house workshops to learn about the management alternatives, meet with the planning team, and to provide comments. A press release was sent to local newspapers advertising the meetings and updates were made to the seashore's website and the NPS Planning Environment and Public Comment (PEPC) website.

The NPS hosted public open house workshops at three locations in communities surrounding the seashore:

- August 16th, 2011 – Wor-Wic Community College, Salisbury, Maryland (26 attended)
- August 17th, 2011 – Marine Science Consortium, Wallops Island, Virginia (38 attended)
- August 18th, 2011 – Ocean Pines Library, Ocean Pines, Maryland (48 attended)

The purpose of the workshops was to gather ideas from individuals on the preliminary management alternatives for the seashore. Poster-size maps and text boards were used to present project background information, the management alternative concepts and their associated management zoning, and a concept comparison chart. GMP team members were present during the open house workshops to answer questions.

The public comment period for the management alternative concepts was from July 20, 2011 through October 1, 2011. The public provided comments via comment cards (10), the PEPC website (155), emails (159), and letters (19).

## Summary of Public Comments on the GMP Management Alternatives

- **Comments on Specific Alternatives**

Overall, the public indicated the greatest support for Alternative 3 – Sustainable Recreation and Climate Change Adaptation. Flexibility in managing future challenges and changes to the island, such as natural coastal processes, sea level rise, and climate change, was frequently mentioned as a positive attribute of the alternative. Many also noted that it offered the best balance between the protection of natural resources and the enjoyment of the resources and recreational opportunities of the island. The importance of maintaining over sand vehicle (OSV) use on the island was frequently cited, with many suggesting that Alternative 3 offers the best approach.

Several favored Alternative 1 – Continuation of Current Management because it would maintain the seashore as it is currently. There were a number of comments that expressed great satisfaction with the seashore as it is today, and some suggested that the island should be left as is. Several others indicated that Alternative 2 – Concentrated Traditional Beach Recreation would provide the best beach recreation opportunities for visitors. Finally, several preferred Alternative 4 – Natural Island Evolution and a Primitive Island Experience because it would provide a true island experience and unique interpretive and educational opportunities.

- **Comments on Visitor Use and Experience**

There were a number of public comments regarding the visitor experience at the seashore, addressing educational programming, recreation opportunities, and interpretive themes. Numerous comments expressed satisfaction with the quality of recreational resources and visitor use opportunities. Ideas for new educational programs at the seashore included winter hiking trips and historical interpretation by staff or partners. A few comments expressed support for a clothing optional beach. Other suggestions included the need to enhance visitor contact areas, orientation, safety messaging, seashore information, and posting of rules.

OSV use at the seashore was a topic of many comments. The comments indicated strong support for continued OSV use and opposition to changes to or reductions in the OSV area. Many comments expressed satisfaction with the current OSV program. Some supported allowing alternate locations for OSV use, if and when that becomes necessary due to natural coastal processes. Other suggestions for the OSV program included re-opening the back road, changes to the fee structure, speed limitations, and the need for 'work-arounds' for Piping Plover closures. A few comments suggested the elimination or reduction of OSV use.

- **Comments on Seashore Facilities and Operations**

Public comments about seashore facilities and operations primarily addressed access, alternative transportation, and parking infrastructure. There was support both for and against expanding visitor use services and facilities in the developed zone. Most indicated support for continued bridge access and repairs to facilities and infrastructure in the event that they are destroyed in a catastrophic storm. Many indicated their support for an adaptive management approach to facility development that promotes sustainability in the context of island dynamics and climate change/sea level rise. Some suggested that any change in access to the island would deter visitation, while others indicated their support for alternative transportation approaches including ferry, shuttle services, and a network of water-based public boat launch sites.

There was interest in additional camping opportunities at the seashore but some expressed concern that a mainland camping experience would be inferior to the current on-island camping opportunities. Others made specific suggestions regarding camping fees, length and type of stay, and generator use in the campground, and ideas for improving the entrance station.

- **Comments on Natural Resource Management**

Natural resource management comments ranged from suggestions for broad management approaches including adaptive management planning, to more specific suggestions related to issues such as invasive plants, habitat restoration, and rare species protection. Many indicated support for a proactive approach to addressing the threats from climate change/sea level rise, such as increasing resiliency and working in concert with natural processes. Others did not support the idea of allowing natural processes to shape the island and expressed concern that a breach or new inlet could impact the ability of visitors to access all parts of the island.

A comment indicated support for various protection and enhancement mechanisms for Chincoteague Bay water quality, including establishing sanctuaries, prohibiting unauthorized commercial fishing, banning of submerged lands leasing for commercial aquaculture, and compliance with applicable wastewater disposal regulations. Some supported dredging to enhance the tidal flow to and from Chincoteague Bay. Many comments indicated support for the continuation of commercial fishing and aquaculture in seashore waters, including the horseshoe crab fishery, and opposed any changes to the current system. Concern for the economic impact to local watermen was frequently cited. Several indicated opposition to any changes that would impact privately-owned structures ('oyster watch houses') in the Virginia waters of the seashore.

There were several comments that expressed support for a marine research reserve at the seashore. Others were concerned about the potential impacts that a marine research reserve could have on the livelihood of watermen and to the use of waterways for public and commercial use.

Several suggested that hunting was an important recreational opportunity and should be allowed to continue at the seashore.

- **Comments on Proposed Wilderness**

Comments on the proposed wilderness area ranged from support for the existing area to the removal of wilderness in the seashore. Some comments expressed concern about the potential that expansion of the wilderness area could affect ORV use.

- **Comments on Cultural Resource Management**

Several comments indicated concern for the removal of hunting camps due to their value in understanding the history of the island and as historic structures. The preservation, as well as active use of the Coast Guard Station was encouraged.

- **Comments on Partnerships**

Several comments addressed the importance of partnerships between state and federal entities in the plan and its implementation. It was suggested that the plan should highlight the existing (and capacity for additional)

partnerships and how they can be used to work cooperatively on land conservation initiatives and solutions to address the effects of coastal processes and climate change/sea level rise. Several indicated support for the continued partnership with the US Army Corps of Engineers related to erosion control and protection of the seashore.

- **Comments on Land Acquisition**

There was support for mainland protection strategies, including expanded land conservation efforts in the Newport Bay, Chincoteague Bay, and Sinepuxent Bay watersheds targeting areas with healthy, functioning perennial streams and tidal creeks.

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# Glossary

**Accessibility**. The provision of park programs, facilities, and services in ways that include individuals with disabilities, or makes available to those individuals the same benefits available to persons without disabilities. Accessibility also includes affordability and convenience for diverse populations.

**Actions needed to achieve desired conditions**. The kinds of changes needed to achieve desired conditions. The actions can be minor or major, depending on how different the desired conditions are from the conditions currently existing in a given area. A description of these actions provides a better understanding of the implications of achieving desired conditions and provides the basis for impact analyses and cost estimating.

**Adaptive Management**. A process that promotes flexible decision making that can be adjusted in the face of uncertainties as outcomes from management actions and other events become better understood. Careful monitoring of these outcomes both advances scientific understanding and helps adjust policies or operations as part of an iterative learning process. It also recognizes the importance of national variability in contributing to ecological resilience and productivity.

**Adaptive reuse.** The process of adapting an historic structure for a new purpose, while retaining the character-defining features that contribute to the historic significance of the structure.

**Affected environment**. The existing biological, physical, cultural, social, and economic conditions that are subject to direct and indirect changes which result from actions described in alternatives under consideration.

**Alternative**. A possible course of action or one of several ways to achieve an objective or vision. The term is used in a GMP to describe different management actions.

**Archeological resource.** Any material remains or physical evidence of past human life or activities that are of archeological interest, including the record of the effects of human activities on the environment. An archeological resource can yield scientific or humanistic information through research.

**Barrier island.** A long broad sandy island lying parallel to a shore that is built up by the action of the waves, currents, and wind and that protects the shore from the effects of the ocean.

**Benthic resources.** Benthic resources include all things found within the benthic zone, which is defined as the bottom of a body of water. The organisms that inhabit the benthic zone are called Benthos. They include sessile forms (e.g., oysters,), creeping organisms (e.g., crabs), burrowing animals (e.g., many clams and worms), fish, plants and seagrasses such as eel grass.

**Best management practices (BMPs)**. Practices that apply the most current means and technologies available to not only comply with mandatory environmental regulations, but also to maintain a superior level of environmental performance.

**Breach**. A continuous exchange of water between the ocean and bay at low tide.

**Breach management protocol or plan.** A plan which specifies the conditions under which the NPS would allow breach closure within the seashore, based on the best science available and conforming to the mission of the NPS and laws governing the seashore,

and taking into consideration human safety and protection of property.

**Carrying capacity** (visitor). The type and level of visitor use that can be accommodated while sustaining the desired resource and visitor experience conditions in a park.

**Climate Change**. Climate change refers to any change in climate over time, whether due to natural visibility or as a result of human activities.

**Consultation.** A discussion, conference, or forum in which advice or information is sought or given, or information or ideas are exchanged. Consultation generally takes place on an informal basis. Formal consultation is conducted for compliance with Section 106 of the National Historic Preservation Act, the National Environmental Policy Act, and with Native Americans.

**Cooperating agency**. A federal agency other than the one preparing the National Environmental Policy Act document (lead agency) that has jurisdiction over the proposal by virtue of law or special expertise and that has been deemed a cooperating agency by the lead agency. State and local governments and/or Indian tribes can be designated cooperating agencies, as appropriate.

**Cultural landscape**. A geographic area (including both cultural and natural resources and the wildlife and domestic animals therein) associated with a historic event, activity or person or exhibiting other cultural or aesthetic values. There are four types of cultural landscapes, not mutually exclusive: historic sites, historic designed landscapes, historic vernacular landscapes, and ethnographic landscapes.

**Cultural resources**. Aspects of a cultural system that are valued by or significantly representative of a culture or that contain significant information about a culture. A cultural resource may be a tangible entity or a cultural practice. Tangible cultural resources are categorized as districts, sites, buildings, structures and objects for the National Register of Historic Places, and as archeological resources, cultural landscapes, structures, museum objects, and ethnographic resources for NPS management purposes.

**Cumulative actions**. Actions that, when viewed with other actions in the past, the present, or the foreseeable future regardless of who has undertaken or will undertake them, have an additive impact on the resource the proposal would affect.

**Cumulative impact**. The impacts of cumulative actions.

**Deferred maintenance.** Maintenance that was not performed when it should have been, and therefore, is delayed. Continued deferment of maintenance results in deficiencies. Deferred maintenance is the cost to repair an asset's deficiencies.

**Desired condition**. A qualitative description of the integrity and character for a set of resources and values, including visitor experiences, that park management has committed to achieve and maintain.

**Direct effect**. An impact that occurs as a result of the proposed action or alternative in the same place and at the same time as the action.

**Enabling legislation.** Laws authorizing units of the national park system.

**Endangered.** A species in danger of extinction through all or a significant portion of its range.

**Environmental consequences**. The scientific and analytic basis for comparing alternatives in an environmental impact statement, based on their environmental effects, including any unavoidable

adverse effects. Environmental consequences include short-term, long-term, and cumulative impacts to ecological, aesthetic, historical, cultural, economic, and social environments.

**Environmental impact statement**. A detailed National Environmental Policy Act document that is prepared when a proposal or alternatives have the potential for significant impact on the human environment.

**Ethnographic resources**. Objects and places, including sites, structures, landscapes, and natural resources, with traditional cultural meaning and value to associated peoples. Research and consultation with people identifies and explains the places and things they find culturally meaningful. Ethnographic resources eligible for the National Register are called traditional cultural properties.

**Environmentally preferred alternative**. Of the action alternatives analyzed, the one that would best promote the policies in NEPA Section 101. This is usually selected by the planning team members. The Council on Environmental Quality encourages agencies to identify an environmentally preferable alternative in the draft environmental impact statement or environmental assessment, but only requires that it be named in the record of decision.

**Fundamental resources and values**. Those features, systems, processes, experiences, stories, scenes, sounds, smells, or other attributes, including opportunities for visitor enjoyment, determined to warrant primary consideration during planning and management because they are critical to achieving the park's purpose and maintaining its significance.

**Gateway community.** A community that exists in close proximity to a unit of the national park system whose residents and elected officials are often affected by the decisions made in the course of managing the park, and whose decisions may affect the resources of the park. Because of this, there are shared interests and concerns regarding decisions. Gateway communities usually offer food, lodging, and other services to park visitors. They also provide opportunities.

**General Management Plan (GMP)**. A National Park Service planning document which clearly defines direction for resource preservation and visitor use in a park, and serves as the basic foundation for decision making. GMPs are developed with broad public involvement.

**Historic site**. A landscape significant for its association with a historic event, activity or person.

**Impact topics**. Specific natural, cultural, or socioeconomic resources that would be affected by the proposed action or alternatives (including no action). The magnitude, duration, and timing of the effect to each of these resources are evaluated in the impact section of an EIS.

**Impairment**. An impact so severe that, in the professional judgment of a responsible NPS manager, it would harm the integrity of park resources or values and violate the 1916 NPS Organic Act.

**Indicators of user capacity**. Specific, measurable physical, ecological, or social variables that can be measured to track changes in conditions caused by public use, so that progress toward attaining the desired conditions can be assessed.

**Indirect effect**. Reasonably foreseeable impacts that occur removed in time or space from the proposed action.

**Interpretation**. Activities or media designed to help people understand, appreciate, enjoy, and care for the natural and cultural environment.

**Issue**. Some point of debate that needs to be decided. For GMP planning purposes issues include major management concerns to be addressed by the GMP and "NEPA issues". NEPA issues are environmental, social, and economic problems or effects that may occur if a proposed action or alternatives (including no action) are implemented or continue to be implemented.

**Lead agency**. The agency either preparing or taking primary responsibility for preparing the National Environmental Policy Act document.

**Management concept**. A brief, inspirational statement of the kind of place a park should be. It could also be described as a vision statement.

**Management zone**. A geographical area for which management directions have been developed to determine what can and cannot occur in terms of resource management, visitor use, access, facilities or development, and park operations. Each zone has a unique combination of resource and social conditions and a consistent management direction. Different actions are taken by the National Park Service in different zones.

**Mitigation**. Modification of a proposal to lessen the intensity of its impact on a particular resource.

**Mitigating measures.** Modification of a proposal to lessen the intensity of its impact on a particular resource.

**National Register of Historic Places (National Register).** The official list of historically significant national, state, and local districts, sites, buildings, structures, and objects maintained by the National Park Service on behalf of the U.S. Secretary of the Interior; established through the National Historic Preservation Act of 1966.

**Native species.** Plants and animals present as a result of natural processes in parks.

**Natural resources.** Collectively, physical resources, such as water, air, soils, topographic features, geologic features, and natural soundscapes; biological resources such as native plants, animals, and communities; and physical and biological processes such as weather and shoreline migration, and photosynthesis, succession, and evolution.

**No Action Alternative**. An alternative in an environmental impact statement that continues the current management direction. This alternative serves as a benchmark against which action alternatives are compared.

**Nonnative species.** Species that occupy or could occupy parklands directly or indirectly as the result of deliberate or accidental human activities.

**Notice of intent**. The notice submitted to the Federal Register that an environmental impact statement will be prepared. It describes the proposed action and alternatives, identifies a contact person in the National Park Service, and gives time, place, and descriptive details of the agency's proposed scoping process.

**Organic Act (National Park Service).** The 1916 law (and subsequent amendments) that created the National Park Service and assigned it responsibility to manage the national parks.

**Other important resources and values**. Those attributes that are determined to be particularly important to park management and planning, although they are not related to the park's purpose and significance.

**Park partner.** Any state or local government (or subdivision thereof), public or private agency, organization, institution, corporation, individual, or

other entity which is engaged in helping to ensure the protection, enhancement and enjoyment of the park's natural, cultural and recreation heritage.

**Park purpose**. The specific reason(s) for establishing a particular park.

**Potential wilderness.** Lands which possess wilderness characteristics which would normally qualify them for designation within the National Wilderness Preservation System but contain temporary non-conforming or incompatible conditions (such as structures or roads) or uses (such as in-holdings, valid mining claims or operations) which prevent their being immediately designated as wilderness. These lands may be identified as "potential wilderness" in NPS wilderness proposals, wilderness recommendations, and by Congress in legislation designating other portions of a park as wilderness. Designated potential wilderness should be converted to designated wilderness once the non-conforming uses have been extinguished by publishing a notice in the Federal Register.

**Preferred alternative**. The alternative an NPS decision-maker has identified as preferred at the draft EIS stage. It is identified to show the public which alternative is likely to be selected to help focus its comments.

**Preservation.** The application of measures to sustain the existing form, integrity, and material of a historic structure, landscape, or object. May include preliminary measures to protect and stabilize the property, but generally refers to the ongoing preservation, maintenance, and repair of historic materials and features rather than extensive replacement and new work. For historic structures, exterior additions are not within the scope of this treatment; however, the limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work to make properties functional is appropriate within a preservation project.

**Primary interpretive themes**. The most important ideas or concepts to be communicated to the public about a park.

**Projected implementation costs**. A projection of the probable range of recurring annual costs, initial one-time costs, and life-cycle costs of plan implementation.

**Proposed wilderness.** The findings and conclusions of a formal wilderness study that have been submitted as the NPS proposal by the Director to the Department of the Interior, but has not been approved by the Secretary.

**Recommended wilderness.** An eligible wilderness area that has been studied and proposed by the NPS, recommended for wilderness designation by the Secretary to the President, and then transmitted by the President as his recommendation for wilderness designation to Congress.

**Record of decision**. The document that is prepared to substantiate a decision based on an environmental impact statement. It includes a statement of the decision made, a detailed discussion of decision rationale, and the reasons for not adopting all mitigation measures analyzed, if applicable.

**Recurring Maintenance.** Preventive maintenance activities that recur on a periodic and scheduled cycle of greater than 1 year, but less than 10 years.

**Rehabilitation.** Making possible an efficient, compatible use for a historic structure or landscape through repair, alterations, and additions while preserving those portions or features that convey its historical, cultural, and architectural values.

**Resiliency**. The ability of a social or ecological system to absorb disturbance while retaining the same basic structure and ways of functioning, the capacity for self-organization, and the capacity to adapt to stress and change.

**Restoration.** Accurate depiction of the form, features, and character of a historic structure, landscape, or object as it appeared in a particular historic period by removing features from other periods and reconstructing missing features.

**Scoping**. Internal NPS decision-making on issues, alternatives, mitigation measures, the analysis boundary, appropriate level of documentation, lead and cooperating agency roles, available references and guidance, defining purpose and need, and so forth. External scoping is the early involvement of interested and affected public.

**Significance**. Statements of why, within a national, regional, and systemwide context, the park's resources and values are important enough to warrant national park designation.

**Special mandates**. Legal mandates specific to the park that expand upon or contradict a park's legislated purpose.

**Stabilization.** Rendering an unsafe, damaged, or deteriorated property stable while retaining its present form.

**Stakeholders**. Individuals and organizations that are actively involved in the project, or whose interests may be positively or negatively affected as a result of the project execution/completion. They may also exert an influence over the project and its results. For GMP planning purposes, the term stakeholder includes NPS officials/staff as well as public and private sector partners and the public, which may have varying levels of involvement.

**Standard**. The minimum acceptable condition for an indicator of a desired condition.

**Stewardship.** The cultural and natural resource protection ethic of employing the most effective concepts, techniques, equipment, and technology to avoid or mitigate impacts that would compromise the integrity of park resources.

**Storm surge.** The abnormal rise of water generated by the winds of a storm, over and above that from predicted astronomic tides.

**Sustainability**. The quality of integrating economic, environmental, and equity (health and well-being of society) considerations in decisions so that the Earth's resources are passed on to future generations in a healthy and abundant manner.

**Sustainable design.** Design that applies the principles of ecology, economics, and ethics to the business of creating necessary and appropriate places for people to visit, live, and work. Development that has been sustainably designed sits lightly upon the land, demonstrates resource efficiency, and promotes ecological restoration and integrity, thus improving the environment, the economy, and society.

**Sustainable practices/principles.** Choices, decisions, actions, and ethics that will best achieve ecological/biological integrity; protect qualities and functions of air, water, soil, and other aspects of the natural environment; and preserve human cultures. Sustainable practices allow for use and enjoyment by the current generation, while ensuring that future generations will have the same opportunities.

**Threatened.** A species likely to become an endangered species within the foreseeable future through all or a portion of its range.

**Traditional.** Pertains to recognizable, but not necessarily identical, cultural patterns transmitted by a group across at least two generations. Also applies to sites, structures, objects, landscapes, and natural resources associated with those patterns. Popular synonyms include "ancestral" and "customary." traditionally associated peoples. May include park neighbors, traditional residents, and former residents who remain attached to a park area despite having relocated. Social or cultural entities such as tribes, communities, and kinship units are "traditionally associated" with a particular park when (1) the entity regards park resources as essential to its development and continued identity as a culturally distinct people; (2) the association has endured for at least two generations (40 years); and (3) the association began prior to establishment of the park.

**User capacity**. The types and levels of visitor and other public use that can be accommodated while sustaining the desired resource conditions and visitor experiences that complement the purposes of a park.

**Value analysis/value engineering.** An organized, multi-disciplined team effort that analyzes the functions of facilities, processes, systems, equipment, services, and supplies for the purpose of achieving essential functions at the lowest life-cycle cost consistent with required performance, reliability, quality, and safety.

**Visitor.** Anyone who uses a park's interpretive, educational, or recreational services.

**Visitor experience**. The perceptions, feeling, and interactions that visitors have with the park's environment and programs. The experience is affected by the setting, the types and levels of activities permitted, and the interpretive techniques used to convey park themes.

**Wayfinding.** The ways in which people and animals orient themselves in physical space and navigate from place to place. Wayfinding is typically used in the context of the built environment to refer to the user experience of orientation and choosing a path, but it also refers to the set of architectural and/or design elements that aid orientation.

**Wilderness.** For the purposes of applying NPS policies, wilderness includes the categories of eligible, proposed, recommended, and designated wilderness. Potential wilderness may be a subset of any of these categories.

**Wilderness character.** The combination of biophysical, experiential, and symbolic ideals that distinguishes wilderness from other lands. The five qualities of wilderness character are Untrammeled, Undeveloped, Natural, Solitude or a Primitive and Unconfined Type of Recreation, and Other Features of Value.

**Wilderness study.** A formal study that evaluates the acreage that has been determined to be eligible for wilderness designation through the completion of a wilderness eligibility assessment. The purpose of the wilderness study is to provide a detailed review necessary to develop official proposals and recommendations for wilderness designation to the Director, the Department, the Present and Congress.

**Wildlife.** Including animals divided into various sub-groups , some of which include: vertebrates (birds, mammals, amphibians, reptiles, fish); molluscs (clams, oysters, octopuses, squid, snails); arthropods (millipedes, centipedes, insects, spiders, scorpions, crabs, lobsters, shrimp), anneilids (earthworms, leeches); sponges; and jellyfish.

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# Index

**Access and circulation,** xxxiv, xxxvii, xli, xlvii, 1-51, 2-11, 2-30, 2-39, 2-51, 2-66, 2-109, 2-110, 3-63 to 3-74, 4-143 to 4-158

**Accessibility**, 3-82

**Accomack County,** 1-54

**Acoustic environment,** 1-39, 1-40

**Actions common to the action alternatives,** 2-19 to 2-35

**Adverse impacts that could not be avoided,** 4-197, 4-198

**Agency coordination,** 5-1 to 5-9, appendix C

**Air quality,** 1-38

**Alternative transportation,** vi, 1-51

**Alternatives,** x-xxix, 2-1 to 2-110

**Alternatives comparison,** 2-84 to 2-88 (in Maryland), 2-89 to 2-90 (in Virginia)

**Alternatives comparison of impacts,** 2-91 to 2-103

**Alternatives development,** 2-1, 2-2

**Archeological resources,** 1-11, 1-40, 1-41, 2-110

**Assateague State Park,** ii, iii, 1-5, 1-52, 1-53

**Berlin, town of,** 1-55, 3-89

**Breach management,** xiii, xiv, 2-12, 2-21, 2-27, 2-36, 2-47, 2-63, 2-109

**Chincoteague National Wildlife Refuge,** i, iii, 1-5, 1-12 to 1-17, appendix B

**Chincoteague, town of,** 1-56, 3-90, 3-93

**Climate change/sea level rise,** iv, v, 2-3 to 2-7, 2-21, 2-27, 3-7 to 3-9

**Coastal bays,** 1-58, 3-13 to 3-16

**Coastal processes,** iv, v, 1-9, 1-20, 1-31, 1-32, 3-8 to 3-13

**Coastal zone management,** 5-8, 5-9

**Commercial services,** 2-109, 3-83

**Communities (gateways),** 3-89 to 3-94

**Community resilience,** xiii, xiv, 2-21, 2-27

**Consistency with National Environmental Policy Act,** 2-104 to 2-108

**Consultation and coordination,** 5-1 to 5-14, appendix C

**Contingency planning,** 2-4 to 2-7, 2-39, 2-51, 2-66,

**Costs,** 2-15, 2-16, 2-34, 2-43, 2-58, 2-72, 2-82 , 2-83

**Cultural landscapes,** xxxiii, xxxvi, xli, xlvii, 1-10, 1-11, 1-50, 2-12, 3-51, 3-52, 4-117 to 4-126

**Cultural resource management,** viii, ix, xii, xx, xxiv, xxviii, xxxiii, xxxvi, xli, xlvi, 1-10, 1-11, 1-22, 1-23, 1-36, 1-50, 2-13, 2-14, 2-33, 2-40, 2-53, 2-54, 2-68, 2-69, 3-47 to 3-52, 4-108 to 4-126, 5-6, 5-7, C-1, C-15

**Cumulative impacts (definition),** 4-2

**Economic benefits of the seashore,** 3-95

**Educational programs,** 3-85, 3-86

**Energy requirements and conservation potential,**

**Environmental justice,** 1-44, 1-45

**Environmentally preferable alternative,** 2-108

**Equestrian use,** 3-81

**Ethnographic resources,** 1-41, 1-42

**Federally listed threatened and endangered species,** xxxii, xxxiii, xxxvi, xl, xli, xlv, xlvi, 1-9, 1-49, 1-50, 3-40 to 3-47, 4-82 to 4-108, 5-7, 5-8, C-2 to C-14, C-16

**Fire management,** 1-50

**Fish,** 3-29 to 3-31, 3-79, 3-80

**Floodplains,** 3-19, 4-4 to 4-29

**Fundamental resources and values,** 1-20

**Future planning,** 2-109, 2-110

**Guidance for seashore planning, development, and management,** 1-18 to 1-30

**Historic structures,** viii, xii, xx, xxxiii, xxxvi, xxxvii, xli, xlvi, 1-10, 1-11, 1-22, 1-23, 1-36, 1-50, 2-12, 2-13, 2-33, 2-40, 2-53, 2-54, 2-68, 2-69, 3-47 to 3-51, 4-108 to 4-117

**Horses and horse management,** 1-22, 2-12, 2-31, 3-17, 3-18, 3-36, 3-78, 3-81, 3-82

**Hunting,** 2-10, 2-28, 3-82

**Impact topics retained,** 1-37

**Impact topics dismissed,** 1-37 to 1-45

**Implementation of the plan,** xlviii, 1-4, 2-109, 2-110

**Indian Sacred Sites,** 1-43, 1-44

**Indian Trust Resources,** 1-44

**Indicators and standards,** 2-76 to 2-78

**Interpretation,** 1-52, 2-110, 3-83 to 3-86

**Interpretive themes,** 1-24,

**Irreversible and irretrievable commitments of resources,** 4-196, 4-197

**Land acquisition,** xii, xx, xxv, xxix, 2-15, 2-34, 2-42, 2-57, 2-71,

**Lightscape,** 1-38

**Management zoning and desired conditions,** 2-19 to 2-26, 2-37, 2-49, 2-65

**Management actions (summary tables),** 2-35, 2-45, 2-46, 2-59, 2-60 to 2-62, 2-74, 2-75

**Marine resources,** xii, xiv, xxxii, xxxvi, xl, xlv, 1-35, 2-31, 2-110, 3-23 to 3-31, 3-79, 3-80

**Methodology for analyzing impacts,** 4-1 to 4-4

**Mitigation measures,** 2-79 to 2-81

**Museum collections,** 1-36, 1-42, 1-43, 2-110

**Natural resource management,** xii, xiv, xx, xxiii, xxviii, xxxi to xxxiii, xxxv, xxxvi, xxxix to xli, xliv to xlvi, 1-9, 1-10, 1-20, 1-21, 2-11, 2-12, 2-13, 2-30 to 2-32, 2-39, 2-40, 2-52 , 2-53, 2-67, 2-68, 4-4 to 4-108 , 5-7, 5-8

**Need for the plan,** 1-2

**Night skies,** 1-38

**North End Restoration Project,** 1-57

**Ocean and bay stewardship,** 1-34, 2-12, 2-13

**Ocean City, town of,** 1-54, 3-93

**Orientation,** 3-83, 3-84

**Other important resources,** 1-22 to 1-23

**Oversand Vehicles (OSVs),** vii, xv, xvi, xix, xxii, xxvii, xxxiv, xxxviii, xlii, xlvii, 1-33, 1-34, 1-51, 2-10, 2-28, 2-37, 2-38, 2-49, 2-50, 2-59, 2-66, 3-68, 3-69, 3-78, 3-79, 4-143, 4-149, 4-152, 4-153, 4-156

**Partnerships,** vii, xii, xx, xxiv, xxix, 1-34, 1-35, 2-14, 2-15, 2-33, 2-42, 2-56, 2-71, 3-60 to 3-63

**Plan development,** 1-2

**Planned and programmed projects,** 2-15, 2-17, 2-18

**Planning challenges (and issues),** ii to viii 1-31 to 1-36

**Preferred alternative,** 2-108

**Preparers,** 5-10, 5-11

**Public involvement,** 5-1 to 5-6, appendix D

**Purpose of the plan,** 1-1

**Related plans,** 1-48 to 1-58

**Related resources,** 1-23

**Relationship between short-term uses of the environment and long-term productivity,** 4-196

**Seashore boundary,** i, iii, xxx, 1-7, 1-8, 1-46 to 1-48, 2-15, 2-34, 2-42, 2-57, 2-71

**Seashore enabling legislation,** appendix A

**Seashore facilities,** xi, xvi, xvii, xix, xx, xxiii, xxvii, xxviii, 2-110, 3-57 to 3-60

**Seashore legislative history,** 1-4 to 1-7

**Seashore legislative mandates,** 1-25 to 1-28

**Seashore other legislative and policy requirements for the seashore,** 1-29

**Seashore operations,** xi, xvi, xvii, xix, xx, xxiii, xxvii, xxviii, xxxiii, xxxvii, xli, xlii, xlvi, 2-14, 2-33, 2-41, 2-42, 2-54, 2-54 to 2-56, 2-69 to 2-71, 2-109, 3-56 to 3-63, 4-126 to 4-143

**Seashore ownership,** i, iii, 1-7, 1-8

**Seashore purpose,** 1-18, 3-1

**Seashore significance**, 1-18, 1-19, 3-1

**Seashore special designations,** 1-25, 1-26, 1-30

**Shellfish**, 3-27 to 3-29, 3-80

**Socio-economic environment,** xxxiv, xxxviii, xliii, xlvii, xlviii, 3-86 to 3-95, 4-178 to 4-196

**Soundscape,** 1-39, 1-40

**Special uses,** 3-83

**Species of special concern,** 3-22 to 3-24, 3-36 to 3-39, C-2 to C-14, C-16

**Tribal coordination,** 5-9

**U.S. Fish and Wildlife Service,** i, iii, 1-5, 1-12 to 1-17, 5-7, 5-8, appendix B, C-16

**Vegetation,** xii, xiv, xx, xxiii, xxvii, xxxi, xxxvi, xl, xlv, 1-9, 1-10, 1-20, 3-20 to 3-23, 4-30 to 4-54

**Visitation,** 3-75, 3-76

**Visitor facilities and infrastructure,** v, xi, xv, xvi, xix, xxii, xxvii, xxxiv, xxxvii, xlvi, 1-12, 1-33, 2-10, 2-11, 2-29, 2-30, 2-39, 2-50 to 2-52, 2-66, 2-67, 2-110, 3-57 to 3-60, 3-64 to 3-73

**Visitor use and visitor experience,** v, xi, xv, xvi, xix, xxii, xxvii, xxxiv, xxxvii, xlvi, 1-12, 1-21, 1-32, 1-33, 2-8 to 2-10, 2-27 to 2-29, 2-36 to 2-39, 2-47 to 2-50, 2-63 to 2-66, 3-75 to 3-86, 4-159 to 4-178

**Water resources,** xxxi, xxxv, xxxix, xliv, 1-9, 1-10, 1-20, 1-23, 1-34, 1-35, 3-13 to 3-20, 4-4 to 4-29

**Wetlands,** xxxi, xxxv, xxxix, xliv, 1-10, 3-16 to 3-18, 4-4 to 4-29

**Wilderness,** vii, viii, xii, xv, xx, xxiii, xxiv, xxviii, 1-35, 1-36, 2-52 , 2-53, 1-45, 1-46, 2-12, 2-32, 2-33, 2-40, 2-67, 2-68, 2-109, 3-52 to 3-55

**Wildlife,** xii, xiv, xx, xxiii, xxxii, xxxvi, xl, xlv, 1-9, 1-10, 1-20, 3-23 to 3-47, 4-55 to 4-108

**Worcester County,** 1-53

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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 our 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.

Assateague Island National Seashore
2016