



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 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 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 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 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 CO₂ 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



- **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 (<i>Charadrius melodus</i>) success through predator control - control <i>Phragmites australis</i> - restore saltmarsh function by filling relic mosquito ditches - remove abandoned roads and properties of no historic or park mission value - pursue new NPS initiatives pertaining to research and monitoring of marine/oceanic resources - establish a groundwater monitoring program - continue to monitor the distribution and abundance of submerged aquatic vegetation - survey distribution, abundance and habitat of rare species (e.g., tiger beetles) - implement a hunting monitoring program
	Cultural Resource Management	- preserve oral history archive for research and use in interpretive media - complete a seashore wide archeological overview and assessment
	Visitor Experience Enhancements	- complete new long-range interpretive plan - replace deteriorated wayside exhibits - develop an enhanced environmental education program - provide a recreational kayak program - 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 - make miscellaneous improvements to the transportation system (roads, bike paths, bridges) for safety management and pavement management - make miscellaneous improvements to campground wastewater treatment facilities - install solar electric service in bath houses, beach hut, and visitor contact station - install shade structure - install shaded interpretive structure and portable pedestrian shelters - install new fencing at Oceanside Campground
	Maryland Mainland Developed Area	- install tertiary system to discharge wastewater - complete initial actions to rehabilitate the environmental education center - complete initial actions to rehabilitate the seashore headquarters complex - make improvements to provide suitable storage for the seashore's museum collection - 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 - replace boardwalks and bike racks - make emergency repairs as needed to repair storm damage - 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) - rehabilitate Virginia maintenance garage vehicle wash bay (on mainland)
Backcountry Area	Primary Area	- maintain Hungerford's House as a backcountry research facility - 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: - 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 - 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 ▪ at the former Green Run Lodge - continue basic maintenance - 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 ▪ existing prohibition on unauthorized commercial harvest of horseshoe crabs would not be enforced ▪ commercial aquaculture leasing and commercial finfishing would continue in Virginia ▪ 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 ▪ 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) ▪ existing prohibition on unauthorized commercial harvest of horseshoe crabs would not be enforced ▪ commercial aquaculture leasing and commercial finfishing would continue in Virginia ▪ no action would be taken related to privately owned structures in Virginia waters ▪
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. 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. 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. ▪ 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. ▪ There is some tolerance for impacts to non-sensitive resources. ▪ Natural processes can be manipulated to protect facilities and infrastructure. ▪ The sights and sounds of human activity are fairly obvious and frequently supplant the sights and sounds of nature. ▪ Sensitive natural and cultural resources are uncommon but, if present, are fully protected. ▪ 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. ▪ Appropriate visitor activities can include sightseeing, swimming, sunbathing, walking, camping, bird watching, fishing, picnicking, participating in educational activities, and experiencing resources. ▪ Visitors see native flora and fauna, but are experiencing a modified environment. ▪ Interpretive and educational opportunities, both self-directed and structured, are focused in these areas. ▪ Special events and activities are allowed with appropriate permits. ▪ The likelihood of encountering other visitors is high. ▪ Visitor activities are regulated to protect elements of the natural environment, prevent visitor conflicts, and enhance public safety. ▪ 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. ▪ Visitor facilities can include kiosks, visitor contact stations and centers, wayside exhibits, observation platforms, nature trails, and educational facilities. ▪ Visitor support facilities can include signs, roads, parking lots, boardwalks, boat launch ramps, restrooms, air stations, picnic areas, and campgrounds. ▪ Administrative facilities can include maintenance shops, utility systems, offices, buildings, staff housing, parking lots, roads, and storage areas. ▪ 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: • It applies to lands within the assigned area in Virginia as defined by the CNWR. • When sensitive natural and cultural resources are present in the Subzone, they are fully protected in collaboration with Chincoteague National Wildlife Refuge. • 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. ▪ 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. ▪ 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. ▪ 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. - 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. - Evidence of human impacts are infrequent and limited in extent. - The protection of sensitive species and habitats is given precedence over visitor use. - Natural sights and sounds dominate, although the sights and sounds of adjacent lands and other visitors intrude in certain areas. - Protecting resource conditions and ecosystem integrity is a high priority.	resources, and hunting (except in primitive camping areas). - 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. - Visitors can see cultural resources. - The likelihood of encountering other visitors is low to moderate. - Visitor activities are regulated to protect the natural environment, prevent visitor conflicts, and enhance public safety. - There are few structured interpretation and education opportunities, although ranger-led programs including environmental education camps may be appropriate. - 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. - Administrative facilities can include sand roads, research quarters, research and resource management apparatus, and environmental education facilities. - 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: - In addition to the other listed visitor activities in the primary zone, off-road driving and primitive RV camping is allowed and hunting is permitted. - 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. - The likelihood of encountering other visitors is moderate to high. - 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. - 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: - 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. - 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. - 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. - Historic buildings and structures are protected, accessible, and maintained to preserve a high degree of integrity. - Interior features of historic structures can be modified to fulfill adaptive uses. - Cultural landscapes are protected and restored. - Archeological resources are identified and evaluated for <i>National Register</i> eligibility. - 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. - Appropriate visitor activities include sightseeing, walking, and experiencing and learning about cultural resources. - Self-directed interpretive and educational opportunities are available to visitors. Structured programs are appropriate. - Visitors see and experience natural resources. - The likelihood of encountering other visitors is low to moderate. - 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. - Visitor facilities can include kiosks, wayside exhibits, walking trails, and boardwalks. - Visitor support facilities can include signs, restrooms, picnic areas, and docking/mooring infrastructure. - Administrative facilities are limited to utility systems, access roads, and parking areas. - 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. - Natural conditions predominate and there is a very low tolerance for resource modifications or degradation. - Natural processes are allowed to occur unimpeded. If impacted, processes are restored or mitigated. - 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. - Evidence of human impacts are infrequent and limited in extent; unauthorized features are removed and natural conditions restored. - 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. - Appropriate visitor activities include canoeing, kayaking, boating, swimming, snorkeling, fishing, clamming, crabbing, and experiencing resources. - Visitors experience the natural abundance, diversity, and genetic and ecological integrity of the plant and animal species native to the estuary ecosystem. - Natural sights and sounds predominate, although the sights and sounds of other users can occasionally intrude. - The likelihood of encountering other visitors is low. - Visitors are in close contact with the rich resources of the seashore, and have opportunities for solitude, adventure, discovery and self-directed learning. - 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. - Visitor facilities can include hunting blinds. - Visitor support facilities can include signs, markers, and docking/mooring infrastructure. - Administrative facilities are limited to research and resource management apparatus. - 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. - Visual characteristics are protected and, as feasible, enhanced through the elimination of incompatible features and activities. - Protecting resource conditions and ecosystem integrity are the highest management priority. - Desired conditions for shellfish are achieved through collaboration with the states and partners.	non-motorized boaters are rare. - Visitor activities are regulated to protect elements of the natural environment, prevent visitor conflicts, and enhance public safety. - There are few structured interpretation and education opportunities. - 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. - Natural conditions predominate and there is a low tolerance for resource impacts; if feasible, existing impacts are mitigated. - Natural processes are allowed to occur unimpeded. If impacted, processes are restored or mitigated. - 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. - 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. - Protecting resource conditions and ecosystem integrity are high priorities. - 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. - Appropriate visitor activities include canoeing, kayaking, boating, swimming, snorkeling, fishing, clamming, crabbing, participating in educational activities, and visitor resources. - Visitors experience the natural abundance, diversity, and ecological integrity of plant and animal species native to the estuary ecosystem. - Natural estuarine environment with natural sights and sounds predominate, although the sights and sounds of adjacent lands and other visitors can intrude. - Interpretive and educational opportunities related to the seashore's estuarine resources, both self-directed and structured, are focused in these areas. - The likelihood of encountering other visitors is moderate. - Conflicts between motorized and non-motorized boater are minimal. - Visitor activities are regulated to protect elements of the natural environment, prevent visitor conflicts, and enhance public safety. - Commercial services can be appropriate in these areas. - 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. - Visitor facilities can include hunting blinds. - Visitor support facilities can include signs, markers, and docking/mooring infrastructure. - Administrative facilities are limited to research and resource management apparatus. - 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. ▪ Natural conditions predominate and there is a low tolerance for resource modifications or degradation. ▪ Natural processes are allowed to occur unimpeded. If impacted, processes are restored or mitigated. ▪ 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. ▪ Evidence of human activities is infrequent and limited in extent. ▪ Natural sights and sounds predominate, although the sights and sounds of adjacent lands can intrude in certain areas. ▪ Visual characteristics of the open ocean are protected and, as feasible, enhanced through the elimination of incompatible features and activities. ▪ 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. ▪ Appropriate visitor activities include swimming, surfing, fishing, kayaking, boating, diving, and experiencing resources. ▪ Visitors experience the natural abundance, diversity, and genetic and ecological integrity of the plant and animal species native to the ocean ecosystem. ▪ Natural ocean environment with natural sights and sounds although the sights and sounds of adjacent lands and other users can intrude in certain areas. ▪ The likelihood of encountering other visitors is low to high. ▪ Visitor activities are regulated to protect elements of the natural environment, protect sensitive species and habitat, prevent visitor conflicts, and enhance public safety. ▪ There are few structured interpretation and education opportunities except at the interface with island developed zones. ▪ States continue to manage shellfishing.	The Atlantic Ocean Zone has no facilities or infrastructure except navigation markers. ▪ 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 VMRC 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 - 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 - 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) - 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 - implement an alternative transportation system – develop facilities to support a mainland-based commercial vehicular shuttle - 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 - 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 - 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 - 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 - work with Virginia and Accomack County to ensure appropriate wastewater treatment and disposal at private structures (e.g. oyster watch houses) - 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. Beach 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

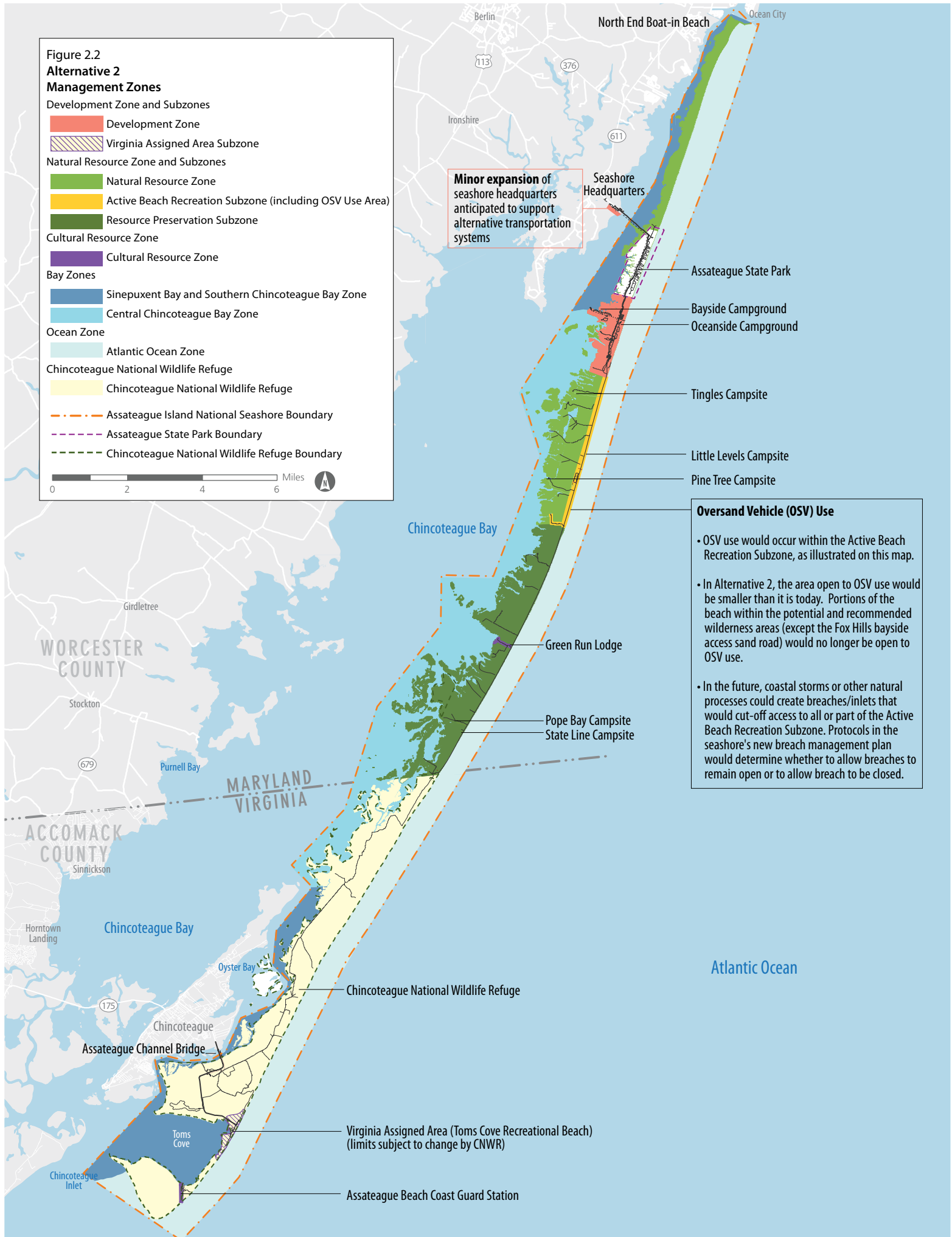
Ocean Zone

- 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



Minor expansion of seashore headquarters anticipated to support alternative transportation systems

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.

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 - with USACE to control beach erosion - with tourism and recreation interests - 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 ▪ expand utility systems in campgrounds (electricity and water to all sites with hardened pads) ▪ expand lifeguard operations and capacity to provide emergency services ▪ designate areas for specific recreation activities (surfing, fishing, swimming, beach fires, etc.) ▪ expand capacity of maintenance division to protect and maintain developed area ▪ retain existing island maintenance yard (bone yard) to support island operations ▪ repair/replace facilities in-kind when damaged or become obsolete (consolidation of developed area could become necessary over time) (contingency action) ▪ develop non-structural storm protection features to protect facilities and infrastructure (beach dune grass planting, sand fencing (for deposition and to exclude horses)) ▪ develop a plan for beach nourishment to protect developed area using heavy equipment to maintain dune ▪ implement beach nourishment to protect developed area (repeat every five years) (contingency action) ▪ 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) ▪ repair breaches when necessary (per breach management plan) (contingency action) ▪ 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 ▪ acquire additional land base as necessary to support new facilities, including: - 10 acres to support ATS development ▪ encourage the state of Maryland to repair Verrazano Bridge and causeway if damaged ▪ 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 ▪ maintain existing backcountry campsites as is with minimal investments ▪ continue prohibition on the use of motorized vessels to access backcountry campsites ▪ 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 ▪ 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 ▪ 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: - no actions to maintain resources - 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



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

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

Green Run Lodge

Pope Bay Campsite
State Line Campsite

Chincoteague National Wildlife Refuge

Assateague Channel Bridge

Virginia Assigned Area (Toms Cove Recreational Beach)
(limits subject to change by CNWR)

Assateague Beach Coast Guard Station

Atlantic Ocean

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 sea 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: - 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 - with Assateague State Park to enhance operational efficiency, cost effectiveness and quality and seamlessness of visitor experience - with Worcester County and adjacent landowners to enable relocation of facilities to the mainland - 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) - 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 - over time, gradually transition to sustainable infrastructure and facilities (contingency action) - when facilities and infrastructure are lost, damaged, or become obsolete (contingency actions): - relocate sustainable facilities to more stable areas within the Maryland Island Developed Area - collaborate with MD DNR in potentially relocating non-sustainable facilities to the mainland - remove hardened infrastructure associated with damaged or relocated facilities - rehabilitate lands and landscape as facilities and infrastructure are removed - as Oceanside RV campgrounds become unsustainable, remove and replace with less infrastructure dependent camping opportunities (contingency action) - design all new and/or replacement facilities to be compatible with natural coastal processes and the effects of climate change (contingency action) - seek to allow breaches and/or new inlets to evolve naturally, in accordance with the breach management plan - minimally maintain existing artificial dune system using methods such as allowing natural westward migration assisted with sand fencing - 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) - expand lifeguard operations to address potential dispersal of visitors within developed area resulting from implementation of ATS (contingency action) - retain, but reduce size of island maintenance yard (bone yard) to support operations - when access is lost implement water-based operations (island docking facility, emergency response, wastewater handling equipment) - 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 - 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) - possibly develop new campground after consultation with Assateague State Park - when access is lost: - implement plan for an expanded ATS including development of a ferry terminal facility and ferry terminal parking (contingency action) - implement plan for water-based park maintenance operations, including development of a mainland docking facility (contingency action) - acquire additional land base as necessary to support new facilities, including: - 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) - 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) - 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 ▪ expand long-term monitoring efforts to include key climate drivers ▪ support cooperative research efforts to better understand the effects of climate change and to develop adaption strategies ▪ enhance and expand outreach and education programs focused on climate change adaptation ▪ identify resources vulnerable to the effects of climate change and work to enhance resiliency ▪ 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 ▪ encourage commercial service operators to provide water transportation to the backcountry recreation areas ▪ maintain use of north end boat-in beach and develop facilities to accommodate use and minimize resource impacts ▪ implement a permit system to manage water-based access to the north end (e.g. docking/mooring pass) ▪ 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) ▪ flexibly manage OSV use to minimize resource impacts and maximize visitor satisfaction (seasonal changes in location and extent of use areas, etc.) ▪ 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: - 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 - 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) - 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: - 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 - seek partners to rehabilitate and adaptively reuse the station - implement non-structural storm protection features, including some future stabilization of the bayside shoreline and ocean side primary dune system ▪ at the former Green Run Lodge: - 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 - rehabilitate and adaptively reuse the lodge to provide a contact station for one of the new backcountry to bay island access points - 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 ▪ encourage the state of Maryland to establish an oyster sanctuary, if feasible ▪ 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 ▪ work with Virginia to ensure appropriate wastewater treatment and disposal at authorized structures (e.g. oyster watch houses) ▪ enact public use closures as needed to protect marine mammal concentration areas and colonial waterbird breeding sites ▪ develop infrastructure (docks, mooring areas, channel markers, etc.) to support 1 to 3 new bayside access points ▪ 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 ▪ encourage the state of Maryland to establish an oyster sanctuary, if feasible ▪ 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 

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

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.

Chincoteague Bay

Green Run Lodge

Pope Bay Campsite
State Line Campsite

Atlantic Ocean

Chincoteague National Wildlife Refuge

Assateague Channel Bridge

Virginia Assigned Area (Toms Cove Recreational Beach)
(limits subject to change by CNWR)

Assateague Beach Coast Guard Station

Chincoteague Inlet

Oyster Bay

Chincoteague

Purnell Bay

MARYLAND
VIRGINIA

WORCESTER
COUNTY

ACCOMACK
COUNTY

Chincoteague Bay

Hornstown
Landing

Sinnickson

Stockton

Girdletree

0 2 4 6 Miles 

- **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 sea 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. -
	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: - with commercial service providers to provide seashore access and visitor services (if access is lost) - 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) - 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 - over time, gradually transition to a day-use area with some opportunities for primitive camping (contingency action) - 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) - design all new and/or replacement facilities to be compatible with natural coastal processes and the effects of climate change (contingency action) - rehabilitate lands and landscape as facilities and infrastructure are removed (contingency action) - develop primitive campsites (approximately 150) - seek to allow breaches and/or new inlets to evolve naturally, in accordance with the breach management plan - when access is lost implement ferry-based ATS operations (island docking facility, wayfinding system, trail improvements) (contingency action) - when access is lost implement water-based operations (island docking facility, emergency response) - 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) - complete rehabilitation of the previous visitor center as a stand-alone environmental education center - when access is lost: - implement plan for an expanded ATS including development of a ferry terminal facility and ferry terminal parking (contingency action) - implement plan for water-based park maintenance operations, including development of a mainland docking facility (contingency action) - acquire up to 25 acres in the general vicinity of the Maryland headquarters complex sufficient to support the relocation of administrative and maintenance facilities - 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 - support cooperative research efforts to better understand the effects of climate change and to develop adaption strategies - identify resources vulnerable to the effects of climate change and work to enhance resiliency - enhance and expand outreach and education programs focused on climate change adaptation - expand use of seashore as a natural laboratory - 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) - 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: - 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 - 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 - 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: - 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 - 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 - at the former Green Run Lodge: - rehabilitate and adaptively reuse the lodge to provide a contact station for one of the new backcountry to bay island access points - 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 - 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 - encourage the state of Maryland to establish an oyster sanctuary, if feasible - 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 - work with Virginia and Accomack County to ensure appropriate wastewater treatment and disposal at authorized structures (e.g. oyster watch houses) - 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 - encourage the state of Maryland to establish an oyster sanctuary, if feasible - 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 - 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 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 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 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 2 Crowding - Ability to camp in backcountry out of sight and sound of other parties	1 140,000-175,000 yards³ of sediment bypassed to north end annually as mitigation for impacts to sediment budget from Ocean City Inlet 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 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 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 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 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 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 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 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 2 User Conflicts – Percentage of non-motorized boaters who experience conflicts with motorized vessels	1 Meets sea grass and living resource objectives: – Median TN , Jan-Dec, 0.56-0.64 milligrams/Liter – Median TP, Jan-Dec, 0.026-0.037 milligrams/Liter – Median Chla, Mar-Nov, 7.5-15 micrograms/Liter – Median DO, Jun-Sep, 6-7 milligrams/Liter 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 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 2 User Conflicts – Percentage of non-motorized boaters who experience conflicts with motorized vessels	1 Meets sea grass and living resource objectives: – Median TN , Jan-Dec, 0.56-0.64 milligrams/Liter – Median TP, Jan-Dec, 0.026-0.037 milligrams/Liter – Median Chla, Mar-Nov, 7.5-15 micrograms/Liter – Median DO, Jun-Sep, 6-7 milligrams/Liter 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 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) 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 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 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. • Minimize use of heavy equipment in waterways. • 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. • Avoid to the extent practicable adverse impacts to wetlands; minimize any impacts to wetlands that cannot be avoided. • 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. • 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: - ensure construction-related equipment arrives on-site free of mud or seed-bearing material - certify all seeds and straw material are weed-free - identify areas of noxious weeds pre-construction - treat noxious weeds or noxious weed topsoil before construction (e.g. topsoil segregation, storage, herbicide treatment) - 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. • Mitigation actions specific to rare, threatened, and endangered species would include: - conduct surveys for rare, threatened, and endangered species as warranted - 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. - 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 - 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. • Use public education, native plants to revegetate disturbed areas, erosion control measures, and barriers to control potential impacts on plants from visitor use. • Use barriers and closures to prevent trampling and loss of sensitive vegetation. • 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. • 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. • 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: – hazardous materials storage and handling procedures – spill containment, cleanup, and reporting procedures; – 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: – a schedule that minimizes impacts on adjacent noise-sensitive uses – use of the best available noise control techniques wherever feasible – use of hydraulically or electrically powered impact tools when feasible – location of stationary noise sources as far from sensitive uses as possible • Site and design facilities to minimize objectionable noise. • 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. • Use minimal-impact lighting techniques including shielded light fixtures to prevent light spill over and use of low-intensity lights. • Shield artificial lighted to prevent disruption of the night sky, physiological processes of living organisms, and other natural processes. • 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. • 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. • 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. • 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. • Consult with culturally associated groups and American Indian tribes, when appropriate. • 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. • 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 Costs¹ (\$2012)	\$ 5,255,000	\$ 6,058,000	\$ 6,364,000	\$ 6,379,000
NPS Staffing – FTE²	41	45.5	47	47
Total One-Time NPS Costs³ (\$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 - response to breaches and/or new inlet formation is uncertain	- island developed area fortification to protect it from threats, as long as suitable land base exists and funding is available - breach management protocol generally supports closing and/or mitigating breaches and/or new inlets in the island developed area	- climate change adaptation, letting the island evolve naturally and relocating/designing new facilities to be more sustainable - 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	- natural island evolution without interference, maintaining facilities only until they are lost, severely damaged, or become obsolete - 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 leading 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 parking 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 - 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 - 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 - with MD DNR, explore consolidation of entrance stations on the mainland
Natural Resource Management (in MD)	- management continues to focus on: - protecting sensitive species - monitoring resource conditions - mitigating external threats - controlling non-native species - 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 - 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 - commercial aquaculture is not present and would	- work collaboratively to better understand the natural and cultural resources within the marine areas of the seashore - the state of Maryland would continue to manage shellfishing within the seashore - commercial aquaculture is not present and would	- work collaboratively to better understand the natural and cultural resources within the marine areas of the seashore - the state of Maryland would continue to manage shellfishing within the seashore - commercial aquaculture is not present and would	- work collaboratively to better understand the natural and cultural resources within the marine areas of the seashore - the state of Maryland would continue to manage shellfishing within the seashore - 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 continue to not enforce existing prohibition on unauthorized commercial harvest of finfish and horseshoe crabs	continue to be discouraged in MD - prohibit harvest of horseshoe crabs as currently proposed by the USFWS' final <i>Comprehensive Conservation Plan</i> - 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 - prohibit harvest of horseshoe crabs as currently proposed by the USFWS' final <i>Comprehensive Conservation Plan</i> - 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 - prohibit harvest of horseshoe crabs as currently proposed by the USFWS' final <i>Comprehensive Conservation Plan</i> - 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 - no change in the size or location of potential and recommended wilderness	- undertake an assessment of wilderness eligibility and prepare a new wilderness study - scope of the proposed wilderness study would consider: - moving eastern boundary to the west to allow OSV use on the beach below the winter storm berm - establishing an administrative area near Green Run Lodge and associated access road - establishing two administrative access corridors	- undertake an assessment of wilderness eligibility and prepare a new wilderness study - scope of the proposed wilderness study would consider: - moving eastern boundary to the west to allow OSV use on the beach below the winter storm berm - establishing an administrative area near Green Run Lodge and associated access road - 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: - USACE - additional commercial service providers	- Expanded/new partnerships with: - Assateague State Park - additional commercial service providers - scientific and educational communities - Worcester County and adjacent landowners on the mainland	- Expanded/new partnerships with: - Assateague State Park - additional commercial service providers - 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) - 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: - 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: - 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: - 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	- the commonwealth of Virginia would continue to manage shellfishing within the seashore - commercial aquaculture leasing would continue in Virginia - continue to not enforce existing prohibition on unauthorized commercial harvest of finfish and horseshoe crabs	- 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 - 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 - prohibit harvest of horseshoe crabs as currently proposed by the USFWS' final <i>Comprehensive Conservation Plan</i> - collaborate with local and regional cultural and academic institutions to develop interpretive programming and other visitor information that	- 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 - 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 - prohibit harvest of horseshoe crabs as currently proposed by the USFWS' final <i>Comprehensive Conservation Plan</i> - collaborate with local and regional cultural and academic institutions to develop interpretive programming and other visitor information that	- 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 - 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 - prohibit harvest of horseshoe crabs as currently proposed by the USFWS' final <i>Comprehensive Conservation Plan</i> - 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 - 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 - 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 - 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 - 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 - 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 - 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 (<i>see row above</i>)	potential for wetland impacts at new development sites as in alternative 2, and at additional new facility sites on the mainland (<i>see two rows above</i>)	potential for wetland impacts at new development sites as in alternative 2, and at additional new facility sites on the mainland (<i>see two rows above</i>)

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 <i>Phragmites australis</i>	same as alternative 1, although the scope of management actions would diminish over time	expanded program to remove the invasive <i>Phragmites australis</i>	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
	N/A	N/A	N/A	N/A
Adverse Impacts	N/A	diminished rehabilitation 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 processes 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 made 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 <i>Phragmites australis</i>	same as alternative 1, although the scope of management actions would diminish over time	expanded program to remove the invasive <i>Phragmites australis</i>	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 management 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 rehabilitation 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 made 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 (<i>Charadrius melodus</i>) and seabeach amaranth (<i>Amaranthus pumilus</i>) 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 (<i>Charadrius melodus</i>) and seabeach amaranth (<i>Amaranthus pumilus</i>) 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 <i>National Register</i> eligible historic structures	N/A	continued maintenance of <i>National Register</i> eligible historic structures	continued maintenance of <i>National Register</i> eligible historic structures
	limited protection of <i>National Register</i> eligible historic structures from natural coastal processes and/or effects of climate change/sea level rise	N/A	enhanced protection of <i>National Register</i> eligible historic structures from natural coastal processes and/or effects of climate change/sea level rise	limited protection of <i>National Register</i> 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 <i>National Register</i> eligible historic structures	enhanced protection as a result of adaptive reuse of one <i>National Register</i> eligible historic structures
Adverse Impacts	eventual loss of <i>National Register</i> eligible historic structures due to natural coastal processes and/or effects of climate change/sea level rise	no maintenance of <i>National Register</i> eligible historic structures	eventual loss of <i>National Register</i> 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 <i>National Register</i> 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 <i>National Register</i> eligible cultural landscape	N/A	continued maintenance of <i>National Register</i> eligible cultural landscape	continued maintenance of <i>National Register</i> eligible cultural landscape
	limited protection of <i>National Register</i> eligible cultural landscape from natural coastal processes and/or effects of climate change/sea level rise	N/A	enhanced protection of <i>National Register</i> eligible cultural landscape from natural coastal processes and/or effects of climate change/sea level rise	limited protection of <i>National Register</i> 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 <i>National Register</i> eligible cultural landscape	N/A
Adverse Impacts	eventual loss of <i>National Register</i> eligible cultural landscape due to natural coastal processes and/or effects of climate change/sea level rise	no maintenance of <i>National Register</i> eligible cultural landscape	eventual loss of <i>National Register</i> 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 <i>National Register</i> 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 <i>NPS Management Policies</i> (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