GULF ISLANDS
NATIONAL SEASHORE

National Park Service
U.S. Department of the Interior
Florida and Mississippi

DRAFT GENERAL MANAGEMENT PLAN / ENVIRONMENTAL IMPACT STATEMENT

General Management Plan / Environmental Impact Statement

Gulf Islands National Seashore

Escambia, Santa Rosa, and Okaloosa Counties, Florida
Jackson and Harrison Counties, Mississippi

Gulf Islands National Seashore was established by the U.S. Congress on January, 8, 1971. Part of the national park system, the national seashore encompasses barrier islands and coastal mainland in Mississippi and Florida and consists of 12 separate units stretching along 160 miles from Gulfport, Mississippi, to Fort Walton Beach in the northwest section of Florida's panhandle. The current authorized acreage for the national seashore is 139,175 acres, which includes 3,800 acres that are designated wilderness area.

In September 2003, Gulf Islands National Seashore initiated a general management planning effort to provide guidance for managing the national seashore during the next 20 years. The national seashore's existing management plan, completed in 1978, does not provide adequate guidance for current environmental, social, political, and legal conditions influencing management of the national seashore. The existing management plan does not address the 2,000-acre Cat Island boundary expansion or the addition of designated wilderness (Horn and Petit Bois Islands), and it also does not meet current NPS planning program standards. The current planning effort will develop and evaluate a range of alternative management strategies to address these issues as well as to address changing visitor use patterns, cultural resources, appropriate scale and type of seashore facilities, wildlife populations, threatened and endangered species, commercial services, and gateway community relationships. The series of storms experienced in the Gulf of Mexico between 2004 and 2005 resulted in a request to suspend the planning effort. During the winter of 2006, national seashore staff and the National Park Service's Southeast Regional Office requested a restart of the general management planning effort.

This new draft management plan examines four alternatives for managing Gulf Islands National Seashore for the next 15 to 20 years. It also analyzes the impacts of implementing each of the alternatives. A**lternative 1** (**the no-action alternative**) consists of continuing the existing management and trends, including recovery efforts to reestablish the national seashore's programs and facilities that existed in 2004 before Hurricane Ivan. This alternative serves as a basis for comparison in evaluating the other alternatives. The concept for management under **alternative 2** would be to reduce the level of infrastructure rebuilt on the barrier islands and allow natural processes to predominate. The visitor experience would transition into a more primitive island experience, while mainland programs and services would be enhanced. The concept for management under **alternative 3** would be to enhance visitor education, research, and resource protection opportunities throughout the national seashore. Alternative 3 is the National Park Service's preferred alternative. The concept for management under **alternative 4** would be to expand and diversify visitor opportunities throughout the national seashore by leveraging additional partnerships.

Overall, the impacts of implementing **alternative 1** would be minor to moderate, long term, and adverse on resources, visitor experience, and national seashore operations. Actions proposed in **alternative 2** would be expected to have a long-term, minor to moderate, beneficial impact on national seashore operations. Impacts on natural resources are expected to be long term, beneficial, and minor to moderate in intensity. Impacts on visitor experience are expected to be long term, moderate in intensity, and adverse. Implementation of **alternative 3** would have long-term, beneficial, and moderate impacts on natural resources though in some areas, adverse impacts might occur. Overall, impacts on visitor experience are expected to be long term, minor to moderate in intensity, and beneficial. The key impacts of implementing **alternative 4** on natural resources are expected to be long term, beneficial, and moderate in intensity, though in some areas adverse impacts may occur. The key impacts on visitor experience Overall, impacts on visitor experience are expected to be long term, moderate in intensity, and beneficial. Across **all action alternatives**, impacts on historic structures would be expected to be both adverse and beneficial and of negligible to minor intensity

This *Draft General Management Plan / Environmental Impact Statement* has been distributed to other agencies and interested organizations and individuals for their review and comment. The public comment period for this document will last for 60 days after the Environmental Protection Agency's notice of availability has been published in the *Federal Register*. Readers are encouraged to submit their comments on this draft plan. Please see the "How to Comment on this Plan" discussion on the next page for further information.

HOW TO COMMENT ON THIS PLAN

Comments on this plan are welcome and will be accepted for 60 days after the Environmental Protection Agency's notice of availability appears in the *Federal Register*. To respond to the material in this plan, written comments may be submitted by any one of several methods as noted below:

Mail:

Gulf Islands National Seashore – GMP
National Park Service
Denver Service Center – Read
P.O. Box 25287
Denver, CO 80225

or

Gulf Islands National Seashore
1801 Gulf Breeze Parkway
Gulf Breeze, FL 32563

Internet Website:

http://parkplanning.nps.gov/guis

Hand Delivery:

Written and/or verbal comments may be made at public meetings. The dates, times, and locations of public meetings will be announced in the media following release of this document.

Commenters are encouraged to use the Internet if at all possible. Please submit only one set of comments.

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment—including your personal identifying information—may be made publicly available at any time. Although you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

SUMMARY

NATIONAL SEASHORE

The Gulf Islands National Seashore (also referred to as the national seashore) was established by the U.S. Congress on January, 8, 1971. Part of the national park system, the national seashore consists of two mainland and two barrier island portions in the northwest section of Florida's panhandle and another mainland section and four barrier islands in Mississippi. These areas (139,175 acres total) were set aside for the purpose of preserving areas possessing outstanding natural, historic and recreational values for public use and enjoyment.

PLANNING PURPOSE AND NEED

General management plans are required for all units of the national park system and are intended to establish the future management direction of a park unit. General management plans look 20 or more years into the future and consider the park system unit holistically, in its full ecological and cultural context and as part of a surrounding region. This general management plan will provide comprehensive guidance for perpetuating natural systems, preserving cultural resources, and providing opportunities for quality visitor experiences at Gulf Islands National Seashore. The purpose of this plan is to decide how the National Park Service (NPS) can best fulfill the national seashore's purpose, maintain its significance, and protect its resources unimpaired for the enjoyment of present and future generations. The plan does not provide specific and detailed answers to every issue facing the national seashore, but rather is a framework to assist NPS managers in making decisions today and in the future.

The national seashore's last management plan, completed in 1978, is outdated. Much has changed over the last 30 years or so, and the 1978 plan no longer adequately addresses the issues facing the national seashore. New information about the significance of natural and cultural resources in the national seashore has been recognized. In Mississippi, the boundary of the national seashore has been expanded to include most of Cat Island and portions of Marsh Point near Davis Bayou. Horn and Petit Bois islands were designated wilderness in 1978 by the U.S. Congress. Private development adjacent to and near the national seashore has increased, and this trend has accelerated in recent years. Other noticeable trends include an increase in the intensity and frequency of storms in the Gulf of Mexico. This has accelerated the rate of repair on national seashore infrastructure resulting from storm damage. Climate change forecasts reinforce the likelihood that this trend will continue into the foreseeable future. The national seashore faces new management challenges as a result of all these changes. This general management plan is needed to update the management framework for the national seashore, address changing issues and conditions, incorporate new resource information, and provide management direction for new national seashore lands.

MANAGEMENT ZONES

Management zones prescribe how different areas of the national seashore would be managed. Seven management zones have been developed for the national seashore—the diverse visitor opportunity zone; recreational beach zone; natural settings with dispersed recreation zone; dispersed recreation zone; seagrass bed protection zone; nonmotorized, primitive visitor opportunity zone; resources management and science priority zone; and national seashore operations zone.

The diverse visitor opportunity zone includes areas capable of absorbing a diverse range of outdoor recreation and interpretive visitor opportunities intermixed within both natural and developed environments. Visitors are

provided a variety of services including orientation, education, and other structured activities. Many visitors enjoy and learn about the national seashore.

The recreational beach zone accommodates traditional recreational beach activities and facilities. Levels of visitor encounters are expected to be highest near access points to and from the beach.

The natural settings with dispersed recreation zone includes areas largely undeveloped, in their natural settings, and managed for disperse motorized and/or nonmotorized recreational activities.

The seagrass bed protection zone includes areas containing seagrass beds and/or areas of suitable habitat for seagrass establishment. These areas are managed to prevent resource damage to seagrass beds from vessel groundings, anchoring, and propeller scarring. Depending on the degree of impacts observed and recorded through NPS monitoring efforts, restrictions may be placed on visitor use in these areas.

The nonmotorized, primitive visitor opportunity zone is undeveloped, primitive, intact wild land that is managed to perpetuate its natural settings. Visitors would need to be self-reliant and prepared for personal challenge. There would only be occasional encounters with others outside of one's group beyond the entry of the zone.

The resources management and science priority zone contains areas of high resource sensitivity and intrinsic value and are managed for the highest level of protection. Visitor use is restricted, unless permitted for research and/or educational purposes.

The national seashore operations zone includes areas of low resource sensitivity that are reserved for administrative and maintenance support of NPS operations. Visitor use is discouraged in these areas; however, visitors engaged in service projects or other official business may be involved in activities in this zone.

The alternatives presented in this document each propose a different configuration of the management zones within the national seashore based on the overall concept for each action alternative. (The no-action alternative, which describes existing conditions, has no management zoning.) In every management zone, the national seashore intends to preserve and protect natural and cultural resources to the greatest extent possible per NPS policy and given available funds.

ALTERNATIVES

Four alternatives, including the preferred alternative, for future management of Gulf Islands National Seashore are presented in this document. Each alternative is consistent with maintaining the national seashore's purpose, significance, and fundamental resources and values; as well as input from the public and agency staff. The alternatives present different choices for managing resources, visitor use, and facilities within the national seashore for the next 15 to 20 years. The four alternatives are titled alternative 1 (no-action alternative), alternative 2, alternative 3 (NPS preferred alternative), and alternative 4.

Alternative 1 (No-Action Alternative)

The no-action alternative primarily reflects current conditions and activities at the national seashore. This alternative is provided as a baseline against which to compare the "action" alternatives. Under this alternative, current national seashore management direction would continue as guided by the 1978 management plan and subsequent more detailed implementation plans. Actions that are already funded are included in the no-action alternative, such as the major hurricane recovery effort currently underway in all areas of the national seashore. These efforts are working toward the restoration of access, programs, and facilities to pre-Hurricane Ivan (2004) conditions. NPS staff would continue

to protect and maintain known cultural and natural resources as time and funding allow. Cultural and natural resource inventory work and monitoring would continue. NPS staff would continue to encourage and seek funding for the research that is needed to fill the gaps in knowledge about resources following the national seashore's strategic plan.

The key impacts of continuing existing management conditions and trends would include use and rehabilitation of cultural resources, such as fortifications and other structures. The changing demands from a growing population with different education and interpretive needs would not be met. Natural resources management programs and funding would remain at current levels. Partnerships with other agencies or local organizations would advance to some degree. Stabilization work on historic structures would be beneficial and long term. Overall, the impacts of implementing alternative 1 would be minor to moderate, long term, and adverse on resources, visitor experience, and national seashore operations.

Alternative 2

Under alternative 2, the national seashore would be managed to encourage, unimpeded, the dynamic coastal processes of the barrier island system. Except for continued preservation of nationally significant forts and essential ship channel dredging, visitor access, beach recreation, and management would yield to the changing natural environment. The opportunity to replace some roads with alternative transportation systems and to minimize developed facilities on barrier islands would be explored. Where appropriate, administrative and maintenance facilities would be relocated from the barrier islands to the mainland. Actions proposed in alternative 2 would be expected to have a long-term, minor to moderate, beneficial impact on national seashore operations.

Under this alternative, natural resources on the barrier islands would be allowed to adapt to natural coastal processes. For example, as storms occur, restoration activities would be focused on reestablishing natural conditions rather than rebuilding infrastructure or facilities on the barrier islands. A marine management program would be developed to inventory and manage marine resources. Overall, impacts on natural resources are expected to be long term, beneficial, and minor to moderate in intensity.

A cultural management program would also be developed under this alternative. Key impacts on cultural resources would include documentation, stabilization, and preservation of historic structures and fortifications. Subsequent to a major storm or other natural event, cultural resource conditions would be assessed and recovery efforts would be limited to repair/replacement in kind, stabilization, and data collection. Impacts that are beneficial and long term, as well as adverse, long term, and of negligible to minor intensity because of the loss of historic fabric during rehabilitation and restoration work, would be expected for cultural resources. Stabilization work would be beneficial and long term.

Visitors would be provided with more primitive opportunities on the barrier islands, while recreational opportunities on the mainland would continue to be varied. Educational and interpretive opportunities would be enhanced on the mainland to compensate for reduced visitor contact and education on the barrier islands. Overall, impacts on visitor experience are expected to be long term, moderate in intensity, and adverse.

Alternative 3 (NPS Preferred Alternative)

In addition to restoring services and facilities to pre-Hurricane Ivan conditions as outlined under alternative 1, under alternative 3, the national seashore would be managed as an outdoor classroom for exploring the natural and human history of the Gulf of Mexico's barrier islands and coastal environments. Interpretive programs would focus on

illustrating how barrier islands act as protectors of the mainland coastline, and the part these islands have played in the last 5,000 years of historic human occupation. Management would also emphasize expanded research opportunities to help inform the educational and interpretive programs. The national seashore would establish an environmental education and research center and develop an active stewardship program while providing expanded educational and interpretive opportunities. The wild and undeveloped nature of the national seashore would be maintained while providing visitor access to seashore educational and recreational opportunities.

The key impacts of implementing alternative 3 would include the development of a cultural resources management program. Historic fortifications and other structures would be rehabilitated to portray their appearance or function during a specific period. Impacts on historic structures would be adverse, long term, and of negligible to minor intensity because of the loss of historic fabric during rehabilitation work. Stabilization work would be beneficial and long term.

Under this alternative, natural resources management would be greatly enhanced with the development of a marine management program, including enhanced scientific study and research in the national seashore. Overall, impacts on natural resources are expected to be long term, beneficial, and moderate in intensity, though in some areas, adverse impacts might occur.

Expanded interpretive programs would include bringing history to life at select coastal fortifications. Overall, impacts on visitor experience are expected to be long term, minor to moderate in intensity, and beneficial.

Alternative 4

The concept for management under alternative 4 would also include the restoration of services and facilities to pre-Hurricane Ivan conditions as outlined under alternative 1. In addition, the national seashore would be managed to provide a diversity of recreational and visitor educational opportunities for experiencing the Gulf of Mexico coastal environments. The National Park Service would seek to collaborate with educational and cultural institutions, nonprofit organizations, and commercial service operators to provide national seashore visitors a greater array of recreational and educational opportunities than what is currently being provided.

The key impacts of implementing alternative 4 on cultural resources would include the adaptive reuse of some historic fortifications and structures to support a diverse range of visitor opportunities. Others might be used for contemporary purposes if they lack potential for restoration to a specific historic period. Impacts on historic structures would be adverse, long term, and of negligible to minor intensity because of the loss of historic fabric during rehabilitation and restoration work. Stabilization work would be beneficial and long term.

Under this alternative, natural resources would be managed to provide a variety of settings that support access and opportunities for visitors. Some natural resources could be modified to provide a wide range of activities, services, and interpretive programs. Overall, impacts on natural resources are expected to be long term, beneficial, and moderate in intensity, though in some areas adverse impacts may occur.

The key impacts on visitor experience would include a greater diversity of visitor opportunities provided by the national seashore and by commercial providers and partners. In some areas, there would be less solitude because of increased access. Overall, impacts on visitor experience are expected to be long term, moderate in intensity, and beneficial.

NEXT STEPS

After the distribution of the *Draft General Management Plan / Environmental Impact*

Statement there will be a 60-day public review and comment period. After the comment period ends, the NPS planning team will evaluate all input received regarding the draft plan and incorporate any resulting changes into a *Final General Management Plan / Environmental Impact Statement*.

Following distribution of the final plan and a 30-day no-action period, a "Record of Decision" may be prepared for signature by the NPS regional director documenting the NPS selection of an alternative for implementation.

Although this *General Management Plan / Environmental Impact Statement* provides the analysis and justification for future national seashore funding proposals, this plan does not guarantee future NPS funding. Many actions would be necessary to achieve the desired conditions for natural resources, cultural resources, recreational opportunities, and facilities as envisioned in this plan. The National Park Service will seek funding to achieve these desired conditions; although the national seashore hopes to secure this funding and will prepare itself accordingly, the national seashore may not receive enough funding to achieve all desired conditions. National seashore managers will need to continue to pursue other options, including expanding the service of volunteers, drawing upon existing or new partnerships, and seeking alternative funding sources, including the philanthropic community. Even with assistance from supplemental sources, NPS managers may be faced with difficult choices when setting priorities. The *General Management Plan / Environmental Impact Statement* provides the framework within which to make these choices.

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INTRODUCTION

A GUIDE TO THIS DOCUMENT

This *Draft General Management Plan / Environmental Impact Statement* is organized into five chapters plus appendices. Each section is described below.

Chapter 1: Introduction describes the context for the entire document. It explains why the plan is being prepared and what issues it will address. It provides guidance (e.g., national seashore purpose, significance, fundamental resources and values, special mandates, and servicewide laws and policies) for the alternatives that are being considered. How this plan relates to other plans and projects is also described.

The chapter also details the planning opportunities and issues that were raised during public scoping meetings and initial planning team efforts (see insert box below); the alternatives in the next chapter address these issues and concerns to varying degrees.

> The primary goal of **scoping** is to gather information and to identify the range of issues and concerns to be addressed in the management plan. Scoping is done with the national seashore staff and with the general public.

Chapter 2: Alternatives, Including the Preferred Alternative, discusses management zones, user capacity, and the four management alternatives (the focus of this plan). Mitigative measures proposed to minimize or eliminate the impacts of some proposed actions are described just before the discussion of future studies and/or implementation plans that would be needed. The evaluation of the environmentally preferred alternative is followed by summary tables of the alternative actions and the environmental consequences of implementing those alternative actions. The chapter concludes with a discussion of alternatives or actions that were dismissed from detailed evaluation.

Chapter 3: Affected Environment describes those areas and resources that would be affected by actions proposed in the various alternatives—historic resources, natural resources, visitor opportunities and use, regional socioeconomics, and NPS operations. It also includes a discussion of impact topics considered but dismissed from detailed analysis.

Chapter 4: Environmental Consequences analyzes the anticipated impacts of implementing the alternatives. Methods used to assess impacts are outlined at the beginning of the chapter.

Chapter 5: Consultation and Coordination describes the history of public and agency coordination during the planning effort; it also lists agencies and organizations who received copies of the document.

The **Appendixes** present supporting information for the document, along with bibliographic references and a list of the planning team and other consultants.

OVERVIEW OF THE NATIONAL SEASHORE

Gulf Islands National Seashore (hereafter referred to as national seashore) was established by the U.S. Congress in January, 8, 1971. Part of the national park system, the national seashore encompasses barrier islands and coastal mainland in Mississippi and Florida and consists of 12 separate units stretching along 160 miles from Cat Island in Mississippi to the eastern tip of Santa Rosa Island in the northwest section of Florida's panhandle (see Region map). The national seashore was set aside for the purpose of preserving areas possessing outstanding natural, historic and recreational values for public use and enjoyment. The current authorized acreage for the national seashore is 139,175 acres.

The resources range from remote wilderness islands with limited visitation to readily accessible snow-white beaches and historic sites visited by several million people each year. It also includes bayou, salt marsh, live oak and southern magnolia forests. The natural environment of Gulf Islands provides support for complex plant and animal communities, both terrestrial and aquatic that characterize the northern Gulf Coast. More than 80% of Gulf Islands National Seashore is submerged lands (open water), but the barrier island beaches are the most outstanding features for those who visit.

For administrative purposes, the national seashore is divided into the Florida District with its six units and the Mississippi District with its six units. Five out of the six Mississippi units are barrier islands: Horn Island, Petit Bois Island, East Ship Island, West Ship Island, and Cat Island. The sixth Mississippi area, Davis Bayou, is on the mainland. Both Horn and Petit Bois islands are federally designated wilderness areas.

The Florida units, which from west to east include Perdido Key, the Naval Air Station Historic Sites, Naval Live Oaks, Fort Pickens, Santa Rosa, and Okaloosa, are in the western end of Florida's panhandle. The Naval Live Oaks Area, on the mainland, was at one time used as a naval live oak plantation by the federal government. The Naval Air Station Historic Sites are also on the mainland, southwest of Pensacola. The other units are all barrier islands or part of barrier islands.

On Perdido Key and Santa Rosa Island there are four 19th century forts built to defend Pensacola Bay. Construction of Fort Pickens, the largest, was initiated in 1829 and completed in 1834. The other forts include Fort Barrancas, and Advanced Redoubt on the mainland, and Fort McRee which is now submerged within the Pensacola Pass area. In the Mississippi District a fifth fort, Fort Massachusetts is on the western edge of West Ship Island. These forts were built as part of a fortification effort to protect all major American harbors after the War of 1812. In addition to the coastal defense forts, numerous artillery batteries can be found that span the time from the Civil War to World War II. Gulf Islands National Seashore also preserves numerous prehistoric and historic archeological sites.

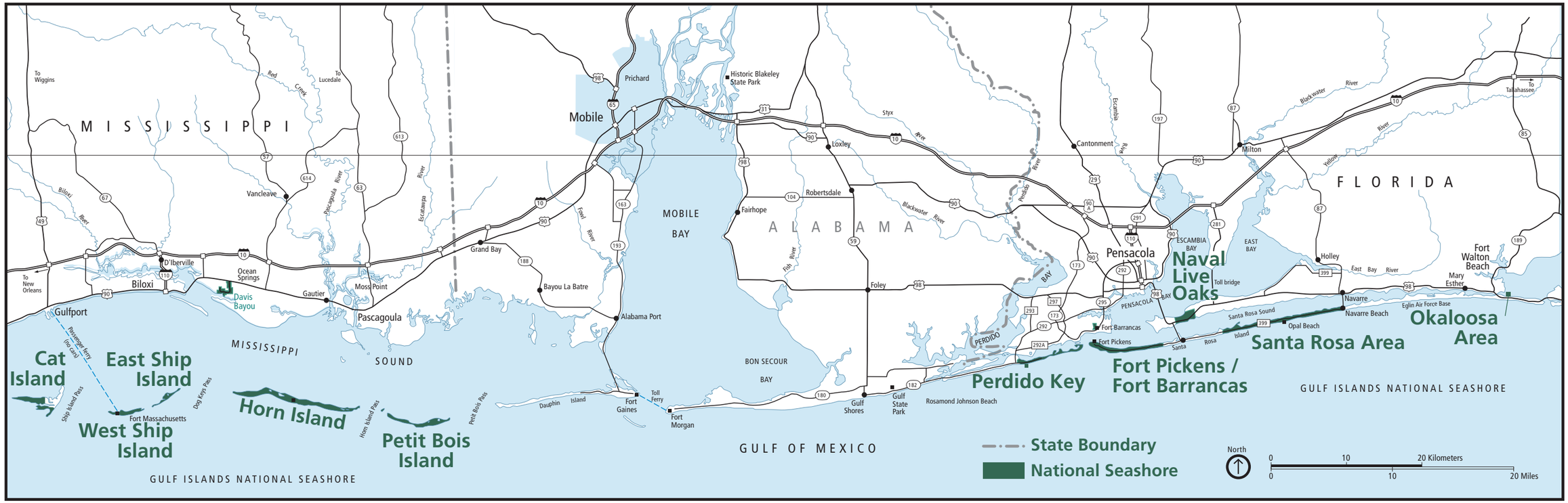
In both the Mississippi and Florida districts, annual temperature averages 77 degrees Fahrenheit, ranging from the lower 60's in December and January to 90 in July and August. Annual precipitation is about 61 inches per year (SERCC 2007).

Hurricanes and storms are important drivers of natural processes as well as human activity at the national seashore. On September 16, 2004, Gulf Islands National Seashore was devastated by Hurricane Ivan, a category 3 hurricane with sustained winds upwards of 130 miles per hour and storm surges 10–16 feet high. The Florida District sustained substantial damage to roads, contemporary and historic structures, a campground, utilities, and landscapes. The national seashore was making significant progress in their storm recovery efforts until the following

storm season started. In 2005, severe storms including Hurricanes Cindy, Katrina, Dennis, and Rita plus Tropical Storm Arlene devastated the Mississippi District of the national seashore. Hurricane Katrina's 30-foot storm surge washed many of the facilities on West Ship Island out to sea and severely damaged the Davis Bayou Area. The Florida District received additional damages. Long-term recovery efforts are substantially complete in both districts.

Barrier islands help protect the mainland coast. But the dune fields along Santa Rosa Island and Perdido Key have been scoured away and are for the most part reduced to a rise of only a few inches above sea level. This has led to problems with even minor storms pushing waters across the barrier islands. Repairs are continuing, but all areas of the national seashore are now open to visitors.

GULF ISLANDS NATIONAL SEASHORE REGION



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BACKGROUND

Park planning is a decision-making process, and general management planning is the broadest level of decision making for parks. General management plans (GMPs) are required for all units of the national park system and are intended to establish the future management direction of a park system unit. General management planning is the first phase of tiered planning and decision making for national park system units. It focuses on why the park unit was established (purpose), why it is special (significance, fundamental resources and values), and what resource conditions and visitor experiences should be achieved and maintained (desired future conditions).

General management plans look 20 years into the future and consider the park unit holistically, in its full ecological and cultural context and as part of a surrounding region. Although a general management plan provides the analysis and justification for future funding, the plan in no way guarantees that money will be forthcoming. Requirements for additional data or legal compliance and competing national park system priorities can delay implementation of actions. Full implementation of a plan may extend many years into the future.

This *General Management Plan / Environmental Impact Statement* (GMP/EIS) was developed by an interdisciplinary team in consultation with National Park Service (NPS) offices; tribal, federal, state, and local agencies; organizations; and other interested parties, and with substantial input and participation from the general public.

PLAN PURPOSE AND NEED

This *General Management Plan* provides comprehensive guidance for perpetuating natural systems, preserving cultural resources, and providing opportunities for quality visitor experiences at Gulf Islands National Seashore. Its purpose is to decide how the National Park Service can best fulfill the national seashore's purpose, maintain its significance, and protect its resources unimpaired for the enjoyment of present and future generations.

This *General Management Plan* describes the general path that the National Park Service would follow in managing the national seashore over the next 20 years or more. The plan does not provide specific and detailed answers to every issue facing the national seashore, but rather is a framework to assist NPS managers in making decisions today and in the future. The plan will

- identify and support the national seashore's purpose, significance, and fundamental resources and values
- provide general guidance for how to manage resources and provide for visitor use
- outline a general approach for facilities management, access strategies, and development patterns
- clearly define desired resource conditions and visitor experience opportunities
- ensure that the foundation for decision making has been developed in consultation with the public and adopted by NPS leadership after sufficient analysis of the benefits, impacts, and economic costs of alternative courses of action

This *General Management Plan* is needed to update the management framework for the national seashore, address changing issues and conditions, and incorporate new resource information. The national seashore's last *General Management Plan,* completed in 1978, is outdated. Much has changed during the last 30 years or so, and the 1978 plan no longer adequately addresses the issues currently facing the national seashore. In Mississippi, the boundary of the national seashore has been expanded to include most of Cat Island and portions of Marsh Point near Davis

Bayou. Horn and Petit Bois islands were designated as wilderness in 1978 by the U.S. Congress. Private development adjacent to and near the national seashore has increased, and this trend has accelerated in recent years. New information about the significance of natural and cultural resources in the national seashore has been recognized. The national seashore faces new management challenges as a result of all these changes. This new *General Management Plan* will update the management framework for the national seashore, address changing issues and conditions, incorporate new resource information, and provide management direction for these new national seashore lands.

PLANNING ISSUES AND CONCERNS

The general public; NPS staff; representatives from other county, state, and federal agencies; and representatives from various organizations identified various issues and concerns during scoping (early information gathering) for this *General Management Plan*. An issue is defined as an opportunity, conflict, or problem regarding the use or management of public lands. Comments were solicited at public meetings, through planning newsletters, and on the national seashore's website (see "Chapter 5: Consultation and Coordination").

Comments received during scoping demonstrated that there is much that the public likes about the national seashore—its management, use, and facilities. The issues and concerns generally involve determining the appropriate visitor use, types and levels of facilities, services, and activities while remaining compatible with desired resource conditions.

The alternatives in this *General Management Plan* provide strategies for addressing the issues within the context of the national seashore's purpose, significance, fundamental resources and values, and special mandates.

Issues

The following issues and management concerns were identified by the public and NPS staff for Gulf Islands National Seashore.

Preserving Coastal Ecosystems. The urban development adjacent to national seashore boundaries has reduced habitat for some threatened and endangered species. This creates additional demands on the National Park Service to mitigate this loss and to protect threatened and endangered species and habitat within the national seashore.

The national seashore has become a refuge for special status species (federal threatened and endangered species and state species of special concern). These species include four types of sea turtles, gopher tortoise, snowy plover, piping plover, Perdido Key beach mouse, and manatee. Critical habitat for several special status species has been designated in the national seashore by the U. S. Fish and Wildlife Service. Seagrass beds, migratory bird habitat, and turtle nesting sites are also at risk due to the pressures of outside development, increased visitation, and increase in storm frequency in the Gulf. *Planning is needed to explore alternatives for balancing resource preservation while accommodating visitor use.*

Enhancing Public Access. Urban growth in the Florida panhandle has decreased the supply of publicly accessible undeveloped seashore beaches, which in turn places a greater demand for beach opportunities within the national seashore. There is strong public interest in improving access to more undeveloped beaches within the national seashore, including improved access to the barrier islands from more mainland locations. *Planning is needed to explore alternatives for enhancing public access to national seashore features.*

Storm Recovery and Sustainability. The national seashore's roads and facilities on barrier islands are often damaged or destroyed by hurricanes and other storms. Storm activity also appears to be increasing in

frequency and intensity. Eight major hurricanes (Opal and Erin 1995; Georges 1998; Ivan 2004; Cindy, Dennis, Katrina, and Rita 2005) and a number of tropical storms in the last 10 years have damaged areas in the national seashore. This period of increased storm activity has accelerated the natural phenomenon of barrier island migration that is endemic to the coastal environment. The loss of primary dune formations along Santa Rosa Island and Perdido Key have exposed transportation corridors and facilities to an increased risk of overwash and damage from future storms; at the same time, demand for access by land and water is increasing. *Planning is needed to explore alternatives for recovery actions/strategies such as replacing some roads with other modes of access and modifying the type and level of facilities rebuilt on barrier islands.*

Acquisitions. The National Park Service has identified several areas of land that may be candidates for acquisition during the lifetime of this general management plan. Additionally, the Pensacola Lighthouse, which managed by the non-profit Pensacola Lighthouse Association under a long-term lease with the U.S. Coast Guard, is an historic structure that may become part of the national seashore in the future. The lighthouse and other identified areas are all within the authorized boundary for the national seashore. Lands that may be acquired include Cat Island, Marsh Point, private lands on Horn Island, land on Santa Rosa Island currently within Eglin Air Force Base, land on Santa Rosa Island between Eglin Air Force Base and Navarre Beach, and land on Santa Rosa Island east of Portofino. The acquisition of new lands and the Pensacola Lighthouse would provide for additional protection of natural and cultural resources in the future, in keeping with the enabling legislation and significance of Gulf Islands National Seashore.

For the purposes of this general management plan, the national seashore will focus its acquisition efforts on lands that are already within its legislated boundary. However, if agencies or private landowners with lands outside the legislated boundaries are interested in transferring lands to the national seashore, these opportunities will be explored.

The acquisition of Cat Island has been an ongoing effort for the past decade. Authority was granted by Public Law 106-554 (December 2000) to expand the national seashore boundary through acquisition of 2,000 acres on Cat Island. The law further stipulates that 150 acres outside this area, known as the Boddie Family Tract, will remain in private ownership. About half of the 2,000 acres authorized has been acquired, and negotiations continue between the federal government and the landowner to acquire the rest. Currently, legal public access on Cat Island is restricted to a canal on the island. Access across the Boddie tract is critical for legal public access across the island, and is a high priority for negotiations. *Planning is needed to explore alternatives for cultural and natural resource protection and visitor opportunities in possible new acquisitions.*

Deepwater Horizon Oil Spill Incident. In April 2010 the Deepwater Horizon oil drilling rig exploded and sank, killing 11 crewmembers and leaking more than four million barrels of oil into the Gulf of Mexico from an uncapped well. The presence of oil in the waters and on the beaches of the national seashore has prompted a comprehensive response by the National Park Service, the U.S. Coast Guard, the National Oceanic and Atmospheric Administration, and the U.S. Fish and Wildlife Service, plus many other state, local, and community organizations.

The National Park Service response has included the involvement of biologists, archaeologists, and numerous support staff. As of October 2010, almost 1,000 tons of oiled debris was removed from Gulf Islands National Seashore, and more than 600 NPS employees have participated in oil spill recovery efforts.

Along with other federal agencies, tribes, and states, the National Park Service is a designated Natural Resource Trustee. The Trustees are responsible for studying and

determining the impacts of the oil spill through a process known as a Natural Resource Damage Assessment (NRDA). In addition to data collection for the NRDA, the National Park Service continues a variety cleanup and recovery efforts to protect natural and cultural resources, as well as human uses such as recreational fishing and boating. *Although this incident does not directly affect the alternatives presented in this general management plan, the oil spill is considered because of its implications on how the National Park Service is protecting cultural and natural resources and providing for visitor enjoyment.*

Climate Change. Climate change refers to any substantial changes in average climatic conditions (such as average temperature, precipitation, or wind) or climatic variability (such as seasonality or storm frequencies) lasting for an extended period of time (decades or longer). Recent reports by the U.S. Climate Change Science Program, the National Academy of Sciences, and the United Nations Intergovernmental Panel on Climate Change (IPCC 2007) provide clear evidence that climate change is occurring and is likely to accelerate in the coming decades.

The National Park Service recognizes that the major drivers of climate change are outside the control of the agency. However, climate change is a phenomenon whose impacts throughout the national park system cannot be discounted. Some of these impacts are already occurring or are expected in Gulf Islands National Seashore in the timeframe of this general management plan. Therefore, climate change is included in this document to recognize its role in the changing environment of the national seashore and provide an understanding of its impact; other factors driving environmental change include population growth in the area (subsidence of water table, increased visitation, pollution), shifts in visitor use patterns, and land-use change and development around the national seashore. The vast majority of visitors access the seashore in motorized vehicles. This presents an opportunity to inform the public on the impacts of motorized vehicles on climate change.

While climate change is a global phenomenon, it manifests differently depending in regional and local factors. Climate change is expected to result in many changes to the Gulf Coast region, including warming ocean waters, hotter summer temperatures and fewer winter freezes, sea level rise, and higher storm surges. Specific impacts on the Gulf Islands National Seashore could include changes in maritime forests on both barrier islands and mainland units, impacts on sensitive species and infrastructure, saltwater intrusion into freshwater environments, submersion of barrier islands, shorelines, and areas of national seashore property, shifting shorelines due to coastal erosion, and changes in the output of the watersheds feeding into the national seashore area. This dynamic environment is expected to have effects on the natural and cultural resources in the national seashore, as well as visitor use patterns. *Planning is needed to address two different issues related to climate change: (1) what is the contribution of the proposed project to climate change, such as greenhouse gas emissions and the "carbon footprint" of the management alternatives and (2) how will the management alternatives alter the ways that climate change affects park resources?*

FOUNDATION FOR PLANNING AND MANAGEMENT

PURPOSE

Purpose statements convey the reason for which the unit was set aside as part of the national park system. Grounded in an analysis of national seashore legislation (appendix A) and legislative history, purpose statements also provide primary criteria against which the appropriateness of plan recommendations, operational decisions, and actions are tested.

The purpose of Gulf Islands National Seashore is to preserve and interpret its Gulf Coast barrier island and bayou ecosystem and its system of coastal defense fortifications, while providing for the public use and enjoyment of these resources.

SIGNIFICANCE

Significance statements capture the essence of the park unit's importance to the nation's natural and cultural heritage. They describe the unit's distinctiveness and describe why an area is important within regional, national, and global contexts. This helps managers focus their efforts and limited funding on protection and enjoyment of attributes that are directly related to the purpose of the park unit. The significance of Gulf Islands National Seashore includes the following five components.

In contrast to the surrounding urban development of the northern Gulf Coast, Gulf Islands National Seashore possesses a rare combination of recreational, educational, and scenic opportunities on publicly accessible natural coastal areas.

Gulf Islands National Seashore preserves and protects the natural processes of an extensive range and variety of terrestrial and marine ecosystems within a very dynamic and rapidly changing landscape of the northern Gulf Coast.

Represented by Horn and Petit Bois islands, Gulf Islands National Seashore preserves one of the few nationally designated barrier island wilderness areas in the national park system.

Gulf Islands National Seashore contains one of the most complete collections of structures relating to the evolution of seacoast defense in the United States. Publicly accessible sites represent a continuum of development from the Spanish colonization of the 18th century through World War II.

The terrestrial and submerged cultural resources located throughout Gulf Islands National Seashore represent a continuum of human occupation and use that is important in enhancing the knowledge of past habitation along the northern Gulf Coast.

FUNDAMENTAL RESOURCES AND VALUES

Fundamental resources and values are systems, processes, features, visitor experiences, stories, and scenes that deserve primary consideration in planning and management because they are critical to maintaining a park unit's purpose and significance. Fundamental resources and values are subject to periodic review and updates based on new information or changing conditions. The following fundamental resources and values are only a portion of the national seashore's total resources and values; all resources and values were considered in this planning effort.

Recreational, Educational, and Scenic Opportunities

Terrestrial and Marine Ecosystems

Gulf Island Wilderness

Collection of Coastal Fortifications

Other Terrestrial and Submerged Cultural Resources

PRIMARY INTERPRETIVE THEMES

Primary interpretive themes are the most important ideas and concepts communicated to the public about the national seashore. Based on the national seashore's purpose, significance, and fundamental resources and values, they are the core of all interpretive programs and media provided to visitors. With these themes, visitors can form intellectual and emotional connections with the resources and experiences.

Preservation and Protection. *Gulf Islands National Seashore is part of the larger national park system set aside by Congress to preserve, protect, and conserve our nation's natural and cultural treasures for current and future generations through stewardship.*

Recreation and Remembrances. *The scenic beaches and bayous create opportunities for recreation, relaxation, solitude, reflection, and memorable experiences. Two federally designated wilderness barrier islands provide rare accessible recreational opportunities and solitude for the public.*

Forts and Firepower. *Early inhabitants of North America seldom strayed far from harbors and rivers because seaports were the gateways to the outside world as well as for potential invaders into the continent. Coastal forts were the "locks" on those gates, and they were updated as new technologies became available and coinciding threats emerged.*

Sea, Sand, Salt Marsh, and Maritime Forest. *Barrier islands, salt marshes, and marine areas are continually reshaped by the dynamic and rapidly changing environment of the northern Gulf Coast.*

Location and Legacy. *Terrestrial and submerged cultural resources within the national seashore identify a continuum of human occupation that dates back approximately 5,000 years in this coastal environment.*

The following pages have been developed to provide the reader with a quick overview of the primary features of Gulf Islands National Seashore. Each sheet is organized by the fundamental resources and values listed above. The significant statement that most closely relates to those resources and values is presented, followed by a more descriptive elaboration of the fundamental resource and value components, and the primary interpretive themes used to communicate the importance of these features to national seashore visitors.

Recreational, Educational, and Scenic Opportunities

Significance Statement

In contrast to the surrounding urban development of the northern Gulf Coast, Gulf Islands National Seashore possesses a rare combination of recreational, educational, and scenic opportunities on publicly accessible natural coastal areas.

Associated Fundamental Resources and Values

Recreation Values. Within a wide variety of seashore settings such as white sand beaches, maritime forests, coastal wetlands, bayous, wilderness islands, and historic coastal fortifications, visitors are provided a broad range of recreational opportunities.

Educational Values. Visitors are provided opportunities to discover, understand, and appreciate the significance of the natural and cultural history of the northern Gulf Coast.

Scenic Values. Visitors are provided opportunities to

- **a.** experience undeveloped beaches, bayous, and mainland areas with panoramic views of a natural coastal setting;
- **b.** experience the sights, sounds, smells, and textures of sugar-white sands, aquamarine salt waters, multihued wildflowers, golden sea oats, and the verdant colors of maritime forests;
- **c.** observe a relative abundance and diversity of wildlife in their native habitat.

Primary Interpretive Themes

Preservation and Protection. Gulf Islands National Seashore is part of a larger system of national parks set aside by Congress to preserve, protect, and conserve our nation's natural and cultural treasures for current and future generations through stewardship.

Recreation and Remembrances. The scenic beaches and bayous create opportunities for recreation, relaxation, solitude, reflection, and memorable experiences. Two federally designated wilderness barrier islands provide rare accessible recreational opportunities and solitude for the public.

Terrestrial and Marine Ecosystems

Significance Statement

Gulf Islands National Seashore preserves and protects the natural processes of an extensive range and variety of terrestrial and marine ecosystems within a very dynamic and rapidly changing landscape located in the northern Gulf Coast.

Associated Fundamental Resources and Values

Coastal Dynamics. The dynamic coastal processes contribute to island migration and the maintenance of structure and function of the barrier islands.

Terrestrial Ecology. The natural processes of a functional terrestrial ecosystem maintains a diversity of habitats for a wide variety of terrestrial organisms by providing nesting and feeding grounds, cover, reproductive space, and vital stop-over habitat along important migration routes.

Marine and Estuarine Ecology. The natural processes of a functional marine and estuarine ecosystem maintains a diversity of habitats for a wide variety of marine organisms by providing underwater juvenile nurseries, feeding grounds, cover, and reproductive space and vital habitat along important migration routes. Seagrass and benthic habitat provides protection for a variety of marine species that contribute to biodiversity.

Sanctuary. For a wide variety of plant and animal species, the national seashore serves as a safe haven and buffer from the direct effects of rapidly declining habitats occurring along the northern Gulf Coast due to the influences of urban development, offshore oil drilling, commercial fishing, and other extractive uses.

Regional Sustainability. Maintaining the integrity of terrestrial and marine resources within the national seashore contributes to the region's ecological and economic sustainability. A healthy ecosystem enhances tourism and commercial fisheries. The national seashore plays a crucial role in nurturing these interdependent systems.

Water Quality. The vitality and health of seashore organisms, humans, and ecosystems are dependent on clean and balanced water quality and functional hydrologic systems.

Scientific Research, Education, and Collections. Exploration and investigation of the coastal environment contributes to the body of scientific knowledge and human understanding. The national seashore is a living laboratory and research ground for the study of natural systems in the northern Gulf Coast, and it serves as a baseline for scientific study. The national seashore's collections and records of natural objects, specimens, and events provide documented evidence of the area's natural history and species richness.

Stewardship. The visitor's exploration and understanding of the natural processes and coastal ecosystems provides opportunities to instill values that promote environmental stewardship within and beyond national seashore boundaries.

Primary Interpretive Themes

Sea, Sand, Salt Marsh, and Maritime Forest. Barrier islands, salt marshes, and marine areas are continually reshaped by the dynamic and rapidly changing environment of the northern Gulf Coast.

Preservation and Protection. Gulf Islands National Seashore is part of a larger system of national park system units set aside by Congress to preserve, protect, and conserve our nation's natural and cultural treasures for future generations.

Gulf Island Wilderness

Significance Statement

Represented by Horn and Petit Bois islands, Gulf Islands National Seashore preserves one of the few nationally designated barrier island wilderness areas in the national park system.

Associated Fundamental Resources and Values

Inspiration and Challenge. Visitors are provided opportunities to experience the wild nature, independence, and solitude of a barrier island.

Natural Processes. Natural processes continue with minimal human influences.

Wilderness Attributes. The undeveloped landscape includes high quality views, natural soundscapes, dark night skies, and natural scents.

Educational Values. Visitors have opportunities to discover, understand, and appreciate the designated wilderness areas of the northern Gulf Coast.

Primary Interpretive Theme

Recreation and Remembrances. The scenic beaches and bayous create opportunities for recreation, relaxation, solitude, reflection, and memorable experiences. Two federally designated wilderness barrier islands provide rare accessible recreational opportunities and solitude for the public.

Collection of Coastal Fortifications

Significance Statement

Gulf Islands National Seashore contains one of the most complete collections of structures relating to the evolution of seacoast defense in the United States. Publicly accessible sites represent a continuum of development from the Spanish colonization of the 18th century through World War II.

Associated Fundamental Resources and Values

Historic Fortifications. The preserved examples of every major phase of seacoast defense fortification up through World War II illustrate the evolution of harbor defenses in response to changes in weapons technology.

a. **Spanish Coastal Fortification**. Pensacola Naval Air Station Historic Sites—Battery San Antonio
b. **American Third System Coastal Fortifications.** Pensacola Naval Air Station Historic Sites—Fort Barrancas (a National Historic Landmark) and Advanced Redoubt; Santa Rosa Area—Fort Pickens; Perdido Key Area—Fort McRee ruins (submerged); and West Ship Island—Fort Massachusetts
c. **Endicott Coastal Fortification Systems.** Fort Pickens Area—Batteries Pensacola, Worth, Cooper, Payne, Trueman, Cullum-Sevier, and Van Swearingen; Perdido Key Area—Fort McRee's Batteries Center and Slemmer
d. **Late 19th Century Coastal Defenses.** Fort Pickens Area—seawall, buildings 1-8 (barracks and officer quarters), warehouse, mine storeroom and loading room, pumping plant, mining casement building, pipe shop, searchlight towers #1 & #2 foundations, railroad roundhouse foundation, and the ruins of the quartermaster's wharf, narrow gauge railroad bed, and mosquito control canal; and Perdido Key Area—Fort McRee's seawall
e. **World War II Coastal Defenses.** Fort Pickens Area—Batteries Langdon and 234, 90 mm gun emplacement platforms, battery commander/coincidence range finder station, battery fixed anti-aircraft emplacement 1 & 2 (ruins), 155 mm Panama mounts, battery fixed ammunition shelter, observation tower foundation, dugout shelter, pump house, ordnance building foundation, and two igloo magazines; and Perdido Key Area—Battery 233.

Spatial Organization. The strategically placed fortifications illustrate the adaptation to coastal terrain and the evolution of harbor defense systems.

Museum Collections. The national seashore maintains collections of artifacts, documents, and archives associated with the fortifications' architecture, weaponry, and histories.

Primary Interpretive Theme

Forts and Firepower. Early inhabitants of North America seldom strayed far from harbors and rivers because seaports were the gateways to the outside world as well as for potential invaders into the continent. Coastal forts were the "locks" on those gates, and they were updated as new technologies became available and coinciding threats emerged.

Other Terrestrial and Submerged Cultural Resources

Significance Statement

The terrestrial and submerged cultural resources located throughout Gulf Islands National Seashore represent a continuum of human occupation and use that is important in enhancing the knowledge of past habitation along the northern Gulf Coast.

Associated Fundamental Resources and Values

Historic Structures and Archeological Sites. In addition to historic coastal fortifications listed earlier, the sites and structures and/or documented evidence of prehistoric and historic human coastal occupation found throughout Gulf Islands National Seashore are as follows:

a. Terrestrial Features

- Fort Pickens Area—Coast Guard station and garage
- Naval Live Oaks Area—
  - *Third Gulf Breeze* (a Woodland and Mississippian archeological site containing a multicomponent shell ring with associated midden)
  - *Big Heart West* (a late Woodland and Mississippian archeological site containing a multicomponent accretionary midden)
  - *Butcherpen Mound* (a Woodland and Mississippian, proto-historic archeological site composed of three separate mounds containing associated stratified deposits)
  - *Naval Live Oaks Cemetery* (a late Mississippian, proto-historic archeological site containing artifacts and numerous human burials)
  - *First American Road in Florida* (an 1824, 2.39-mile remnant of the first road constructed in Florida to connect St. Augustine with Pensacola)
  - *Naval Live Oaks Area* (multiple Early, Middle, and Late Woodland and Mississippian, First Spanish, Early American, and antebellum archeological sites containing accretionary middens, mounds, cemeteries, and shell rings)
- Davis Bayou—middens and CCC cabins 1 and 2
- Cat Island—World War II War Dog Reception and Training Center
- West Ship Island—foundations of the lighthouses and associated barracks
- East Ship Island—D'Iberville French Warehouse Site (location of a 1717 warehouse complex yielding artifact concentration)

b. Submerged Features

- East Ship Island—D'Iberville French Warehouse Site (ballast piles; U.S. quarantine station)
- Seashore General—numerous undocumented shipwrecks

Naval Live Oaks Reservation. As one of the first federal ventures into conservation, this federal tree farm was established in 1828 with the intended purpose of using the live oaks for shipbuilding.

Museum Collections. The artifacts, documents, and archives contribute to the knowledge and understanding of the stories and events associated with human occupation of the northern Gulf Coast.

Primary Interpretive Theme

Location and Legacy. Terrestrial and submerged cultural resources within the national seashore identify a continuum of human occupation that dates back approximately 5,000 years in this coastal environment.

SPECIAL MANDATES AND ADMINISTRATIVE COMMITMENTS

Special mandates, agreements, and administrative constraints are legal requirements and administrative commitments that apply to a specific unit of the national park system. They are mandated by Congress or by signed agreements with other entities. They are specific to the park unit and are not an inventory of all the laws applicable to the national park system. Often there are special mandates or constraints that direct park planning and management decisions—such as mandating hunting within a park unit.

For Gulf Islands National Seashore these special mandates include the following.

Land Acquisition

Authority: Public Law 106-554 (Dec. 21, 2000)

Within the boundaries of the national seashore, lands, waters, and interests therein may be acquired by donation, purchase with donated or appropriated funds, or exchange, except that property owned by a State or any political subdivision, thereof, may be acquired only with the consent of the owners.

Submerged lands (1 mile buffer zone surrounding lands of Cat Island) can only be acquired by donation from the state of Mississippi.

Authority: Public Law 95-625 (Nov. 10, 1978)

Gulf Islands National Seashore was authorized to acquire 1,000 acres along Marsh Point. Acquisition of this land has not taken place, but the lands would be managed under this plan should a willing seller and funding become available.

Pensacola Naval Air Station

Authority: Public Law 91-660 (Jan. 8, 1971)

The Pensacola Naval Air Station regulates public access ways to Bateria de San Antonio (Water Battery), Fort Barrancas, the Advanced Redoubt, and the visitor center located within their boundaries. Public access may be restricted during heightened national security level changes.

Wilderness Management

Authority: Public Law 95-625 and Wilderness Act of 1964

In 1978 Congress designated Horn and Petit Bois islands as Gulf Island Wilderness and included them in the national wilderness preservation system. About 1,800 acres of wilderness plus 2,800 acres of potential wilderness (on nonfederal lands) were designated on map 63520, 018-A dated March 1977. Fourteen private parcels were included in this authority, but active shoreline processes have complicated boundary delineations because some of the lands yet to be acquired are now being submerged.

In accordance with the requirements of the Wilderness Act, facilities will not be provided for the convenience of visitors because the islands will be managed to maintain their primeval character. There is a small administrative enclave on Horn Island for the purposes of maintaining a dock, ranger station, and Air National Guard tracking facility. (The Air National Guard has identified this tracking facility for removal.) Essential administrative activities in wilderness will be carried out to the fullest extent possible without the use of motorized equipment in accordance with the Wilderness Act of 1964. Wilderness at Gulf Islands National Seashore ends at the mean high tide mark, and does not extend over submerged lands within the seashore boundary.

Navigation and Maritime Safety

Authority: Public Laws 91-660 and 95-625

The establishment of the national seashore shall not abridge the authority of the U.S. Army Corps of Engineers, with respect to navigation or related matters, except that beach erosion control and hurricane protection activities shall be planned jointly between the U.S. Army Corps of Engineers and the Department of the Interior.

Public Law 95-625 allows Coast Guard and Federal Aviation Administration to use the areas designated wilderness for navigational and maritime safety purposes.

The national seashore enabling legislation specifically mentions that the Secretaries of the Interior and Army may cooperate in matters relating to beach erosion control and hurricane protection. It states that

> any such protective works or spoil deposit activities undertaken by the Chief of Engineers, Department of the Army, shall be carried out within the seashore in accordance with a plan that is acceptable to the Secretary of the Interior and that is consistent with the purposes of this Act (PL 91-660 Section 6).

The U.S. Army Corps of Engineers and the national seashore continue to build partnerships that enable effective beach control and hurricane protection that meets the mandates of both agencies. In particular, the national seashore will continue to collaborate with the U.S. Army Corps of Engineers to place sand derived from dredging back into the active transport system, to then be redeposited according to natural processes fundamental to the dynamics and survival of barrier islands.

Rights-of-Way and Easements

Authority: Public Law 106-554

The law amends the national seashore's enabling legislation by including a provision to allow for an easement over approximately 150 acres of land on Cat Island known as the Boddie Family Tract. This easement has yet to be negotiated.

Authority: Public Law 91-660

Existing gas and oil transmission easements and rights-of-way through the national seashore [when oil and gas are removed from outside the boundaries] shall not be diminished, and the Secretary [of the Interior] may permit additional rights-of-way or easements.

Authority: Public Law 95-625

The Department of Defense (U.S. Air Force) had a right-of-way to operate and maintain a small, unmanned tracking instrument and associated facilities within the wilderness enclave on Horn Island. This authority has expired, and the national seashore is working with the Air National Guard to remove the facilities.

Local Utility Agreements and Easements

The national seashore has a right-of-way agreement with the city of Gulf Breeze to allow for the construction and maintenance of a storm drain and water line along the northwestern boundary of the Naval Live Oaks Area.

The Florida Department of Transportation was granted a perpetual easement and 160 foot wide right-of-way to operate, maintain, and repair that section of U.S. Highway 98 that crosses the Naval Live Oaks Area. The easement includes the right to issue and renew public utility permits within the right-of-way.

Gulf Power Company has rights-of-way to operate and maintain an underground

electrical line and facilities in the Naval Live Oaks Area and for an electrical distribution system within the Fort Pickens Area.

The City of Ocean Springs, Mississippi, has a right-of-way to operate and maintain existing water and sewer systems within the Davis Bayou Area.

Hunting and Fishing

Authority: Public Law 91-660

Hunting and fishing shall be permitted on lands and waters within the national seashore in accordance with applicable federal and state laws except where or when prohibited by the secretary for reasons of public safety, administration, fish or wildlife management, or public use and enjoyment. The national seashore cooperates with the states of Florida and Mississippi to allow recreational fishing. On April 6, 1995, the Office of the Solicitor rendered an opinion that neither the act authorizing the creation of Gulf Islands National Seashore nor the applicable regulations permit commercial fishing within the boundaries of the national seashore.

Pursuant to Public Law 91-660, the national seashore entered into a long-term Memorandum of Agreement with the Florida Fish and Wildlife Conservation Commission in 2000. The agreement calls for joint management of waterfowl hunting along certain sections of Perdido Key and Santa Rosa near Opal Beach. The national seashore is currently developing a plan in partnership with the commission to continue waterfowl hunting.

Commercial Services

Authority: Acts of August 25, 1916 (16 U.S.C. 1, 2-4) and November 13, 009 (Public Law 105-391)

Commercial services are provided at Gulf Islands National Seashore by way of concessions contracts and commercial use authorizations.

In Florida, a campground convenience store at the Fort Pickens campground and snack bar facilities near the Fort Pickens fishing pier are operated under a concessions contract. Under this contract, the concessioner may operate a snack bar with food and beverage services including film, souvenirs, and sundries at Opal Beach in the Santa Rosa Area, and at Johnson Beach in the Perdido Key area.

In Mississippi, boat transportation service between Gulfport and West Ship Island and the associated visitor services are provided under a concessions contract. The contract includes the selling of a limited line of refreshments and sundries on board the vessels, a snack bar and limited gift items and beach equipment rental on West Ship Island. The operation includes ferry service to West Ship Island and shuttle service between West and East Ship islands.

Commercial use authorizations in both districts of the national seashore provide an opportunity to businesses to provide recreational opportunities to visitors, including but not limited to fishing charters, water taxi service, kayaking opportunities, and diving lessons.

Law Enforcement

Federal jurisdiction over law enforcement matters is mixed. In Florida, all units, with the exception of the Naval Air Station Historic Sites Area and possibly some waters in the Perdido Key Area are under concurrent jurisdiction, meaning that both the federal government and the state have the power to deal with all degrees of crimes. Exclusive federal jurisdiction has been retained for the Naval Air Station Historic Sites Area because the surrounding Naval Air Station lands are held under the same federal jurisdiction.

In Mississippi, all lands and waters of the national seashore are under concurrent

jurisdiction except for inholdings and recently acquired lands, which are under proprietary jurisdiction. NPS law enforcement actions include the enforcement of federal and state criminal laws, traffic statues, and NPS regulations aimed at protecting resources and visitor experience from inappropriate activities.

Authority: Memorandums of Agreement

Memorandums of agreement with a number of local law enforcement agencies provides the opportunity to work in harmony for the common purpose of better protecting life and property of the public they serve by cooperating in the use of trained personnel and equipment where unforeseen threats to human life and property within the respective jurisdictions arise. These groups include the following:

Florida
- City of Gulf Breeze Police Department
- Escambia County Sheriff's Department
- Okaloosa County Sheriff's Department
- Santa Rosa County Sheriff's Department

Mississippi
- Ocean Springs Police Department

Authority: Memorandum of Agreement

A memorandum of agreement with the Mississippi Department of Wildlife, Fisheries and Parks provides for the state of Mississippi to assist in the enforcement of federal laws and regulations on the lands and waters of Gulf Islands National Seashore within the state of Mississippi. The national seashore also has memorandums of understanding with the Jackson County and Harrison County sheriff's offices for the same purpose.

Fire Protection and Emergency Medical Services

Authority: Memorandum of Understanding

Memorandums of understanding with a number of local fire departments allow for the assistance of structural fire prevention/suppression and the protection of life and property from fire on lands administered by the national seashore. These groups include the following:

- Gulf Breeze Volunteer Fire Department, FL
- Escambia County Fire and Rescue, FL
- Naval Air Station Pensacola, FL
- Okaloosa Island Fire District, FL
- Ocean Springs Fire Department, MS

Authority: Memorandum of Understanding

A memorandum of understanding with Big Lagoon State Park provides for personal services and equipment required for prevention and suppression of wildland fires and the protection of life and property from these fires in the Perdido Key Area administered by Gulf Islands National Seashore and Big Lagoon State Park administered by the state of Florida.

Authority: Cooperative Agreement

A cooperative agreement with the Florida Department of Agriculture and Consumer Services allows for conducting fire management activities and preliminary fire-related investigations.

Fort Pickens Aquatic Preserve

Authority: 18-20 *Florida Administrative Code*

The Fort Pickens Aquatic Preserve surrounds the western end of Santa Rosa Island and the eastern end of Perdido Key. The preserve is managed by the Florida Department of Environmental Protection and contains state-owned submerged lands from the Gulf Intracoastal Waterway on the north to 3 miles offshore in the Gulf of Mexico. Aquatic preserves are "established for the purpose of being preserved in essentially natural or existing condition so that their aesthetic, biological, and scientific values may endure for the enjoyment of

future generations." The preserve includes nearly 6,000 acres within the Perdido Key Area, extending from the east tip to 1.5 miles inside the national seashore's western boundary. It also includes more than 8,000 acres in the Fort Pickens Area from the eastern boundary to Pensacola Pass.

Management of the preserve will be a joint effort between the state Department of Environmental Protection and the National Park Service.

Outstanding Florida Waters

Authority: State of Florida designation

The Florida Department of Environmental Protection designated waters within Gulf Islands National Seashore as "Outstanding Florida Waters." This designation grants special protection to Florida waters based on their natural attributes. The Florida Department of Environmental Protection cannot issue permits for direct or indirect pollutant discharges that would degrade ambient water quality of such designated waters. Permit requests for new dredging and filling in such designated waters must undergo an intensive review to determine if they are clearly in the public interest. Elements of the public interest include the conservation of fish and wildlife, erosion and shoaling, navigation, fishing, recreation, and marine productivity. Exceptions to protection of such designated waters include permitted activities preceding designation, restoration of existing seawalls, and activities not regulated by the Florida Department of Environmental Protection for water quality protection purposes (i.e., fishing and boat speeds). Temporary degradation of water quality may be permitted during construction or activities to enhance public use or to maintain pre-existing activities may be allowed with certain restrictions.

SERVICEWIDE LAWS AND POLICIES

Many park system unit management directives are specified in laws and policies and are therefore not subject to alternative approaches. For example, there are laws and policies about managing environmental quality (such as the Clean Air Act, the Endangered Species Act, and Executive Order 11990 "Protection of Wetlands"); laws governing the preservation of cultural resources (such as the National Historic Preservation Act and the Native American Graves Protection and Repatriation Act); and laws about providing public services (such as the Architectural Barriers Act Accessibility Standards)—to name only a few. In other words, a general management plan is not needed to decide that it is appropriate to protect endangered species, control exotic species, protect historic and archeological sites, conserve artifacts, or provide for access for disabled persons. Laws and policies have already decided those and many other things for us. Although attaining some conditions set forth in these laws and policies may have been temporarily deferred in a national park system unit because of funding or staffing limitations, the National Park Service will continue to strive to implement these requirements with or without a new management plan.

There are other laws and executive orders that are applicable solely or primarily to units of the national park system. These include the 1916 Organic Act that created the National Park Service; the General Authorities Act of 1970; the act of March 27, 1978, relating to the management of the national park system; and the National Parks Omnibus Management Act (1998).

The NPS Organic Act (16 *United States Code,* Section 1) provides the fundamental management direction for all units of the national park system:

> [P]romote and regulate the use of the Federal areas known as national parks, monuments, and reservations . . . by such means and measure as conform to the fundamental purpose of said parks,

> monuments and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.

The National Park System General Authorities Act (16 *United States Code* [USC] Section 1a-1 et seq.) affirms that while all national park system units remain "distinct in character," they are "united through their interrelated purposes and resources into one national park system as cumulative expressions of a single national heritage." The act makes it clear that the NPS Organic Act and other protective mandates apply equally to all units of the system. Further, amendments state that NPS management of park units should not "derogat[e] . . . the purposes and values for which these various areas have been established."

The National Park Service also has established policies for all units under its stewardship. These are identified and explained in a guidance manual entitled NPS *Management Policies 2006*. All alternatives considered in this document incorporate and comply with the provisions of these mandates and policies.

DESIRED CONDITIONS AND MANAGEMENT STRATEGIES

This section focuses on desired conditions and strategies to guide management of Gulf Islands National Seashore in all alternatives. They guide actions taken by NPS staff on such topics as natural and cultural resource management, visitor use management as well as other management strategies. Each topic discussed below in table format has three key parts: (a) desired conditions for that topic, (b) a list of law or policy sources, and (c) broad management strategies that may be used to achieve those desired conditions.

Desired conditions articulate the ideal conditions the National Park Service is striving to attain. The term desired conditions is used interchangeably with goals. Desired conditions provide guidance for fulfilling the national seashore's purpose and for protecting the national seashore's fundamental resources and values.

The strategies describe actions that could be used by the National Park Service (and/or its partners) to achieve the desired conditions. Most of these strategies are already being implemented. Those not already being implemented are consistent with NPS policy, are not believed to be controversial, and require no analysis and documentation under the National Environmental Policy Act of 1969 (or analysis and documentation would be completed separately from this *General Management Plan / Environmental Impact Statement*). This is not an exhaustive list of management strategies. As new ideas, technologies, and opportunities arise, they would be considered if they further support the desired condition.

The desired conditions and management strategies in this section, combined with the management actions that are specific to the management alternative ultimately selected for implementation (see chapter 2), will form the complete general management plan for the national seashore.

NATURAL RESOURCE MANAGEMENT STRATEGIES

ECOSYSTEM MANAGEMENT (terrestrial and marine)	
Desired Conditions	**Sources**
Natural resources will be managed to preserve fundamental physical and biological processes, as well as individual species, features, and plant and animal communities.	• NPS *Management Policies 2006* • NPS 77, "Natural Resource Management Reference Manual #77"

Management Strategies

- Inventory all ecosystem components.
- Develop a Natural Resource Condition Assessment to document the current status of natural resource conditions.
- Develop a Resource Stewardship Strategy to identify resource management priorities, consider sequencing of projects, and link on-the-ground projects to higher-tier management goals and objectives.
- Determine limits of natural system variation.
- Monitor system dynamics to detect abnormal changes in time to affect remedial actions.
- Maintain and restore all components and processes of naturally evolving national seashore terrestrial and marine ecosystems, recognizing that change caused by extreme natural events such as hurricane events are an integral part of functioning natural systems.
- Maintain natural genetic diversity of terrestrial and marine ecosystems.
- Maintain or improve water quality affecting terrestrial and marine ecosystems.
- Maintain or improve air quality affecting terrestrial and marine ecosystems.
- Maintain natural terrestrial and marine viewsheds.
- Protect and restore threatened and endangered species and their critical habitat.
- Work with state agency partners to provide for recreational hunting and recreational fishing per the national seashore's enabling legislation and related laws, while managing for healthy fish and waterfowl populations.
- Regulate and mitigate human activities to minimize adverse impacts.
- Educate visitors about the importance and fragility of terrestrial and marine resources, threats to them, and mitigation to lessen impact.

FIRE MANAGEMENT	
Desired Conditions	**Sources**
National seashore fire management programs are designed to meet resource management objectives prescribed for the various units of the national seashore. All wildland fires are effectively managed, considering resource values to be protected and firefighter and public safety, using the full range of strategic and tactical operations as described in an approved fire management plan.	• NPS *Management Policies 2006* • DO 41, "Wilderness Preservation and Management"

Management Strategies

- Maintain a current fire management plan to reflect changes in wildland fire policy, fire use applications, and the body of knowledge on fire effects within the national seashore's vegetation types.
- Maintain a cooperative agreement for fire suppression with appropriate federal, tribal, state, and local agencies and organizations.
- Provide information on whether specified objectives for prescribed fires are met. Monitoring programs instituted for such fires to record fire behavior, smoke behavior, fire decisions, and fire effects.
- Conduct research and monitor the effects of fire to ensure that resource objectives are met.

- Use fire as a management tool to maintain native plant communities and control exotic species.
- Provide visitors information so that they can learn the role of fire in the ecosystem.

SPECIAL STATUS SPECIES	
Desired Conditions	**Sources**
Federally listed and state listed threatened and endangered species and their habitats are protected and sustained. Native threatened and endangered species populations that have been severely reduced in or extirpated from the national seashore are restored where feasible and sustainable. Migratory birds, with a primary focus on species of concern, and their habitat are protected and sustained. Species that have been severely reduced in or extirpated from the national seashore are restored where feasible and sustainable.	• Endangered Species Act • Florida and Mississippi equivalent state protective legislation, such as the Florida Endangered and Threatened Species Act and the Mississippi Nongame and Endangered Species Conservation Act • NPS *Management Policies 2006* • NPS 77, "Natural Resource Management Reference Manual #77" • Memorandum of Understanding between the National Park Service and the U.S. Fish and Wildlife Service to Promote the Conservation of Migratory Birds

Management Strategies

- Support research that contributes to management knowledge of special status species and their habitat.
- To protect rare or protected species and their habitat, complete an inventory of rare or protected plants and animals in the national seashore and regularly monitor the distribution and condition (e.g., health, disease). Modify management plans to be more effective based on the results of monitoring.
- Consult with the U.S. Fish and Wildlife Service and NOAA National Marine Fisheries Service, as appropriate, to ensure that NPS actions comply with the Endangered Species Act.
- Survey for, protect, and strive to recover all species native to the national seashore that are listed under the Endangered Species Act.
- Participate in the recovery planning process when appropriate.
- Manage designated critical habitat, essential habitat, and recovery areas to maintain and enhance their value for listed species.
- Support the conservation of migratory birds through research, education, and protective measures.

NATURAL RESOURCE MANAGEMENT STRATEGIES

EXOTIC SPECIES	
Desired Conditions	**Sources**
The management of populations of exotic plant and animal species, up to and including eradication, are undertaken wherever such species threaten national seashore resources or public health and when control is prudent and feasible.	• Executive Order 13112, "Invasive Species" • NPS *Management Policies 2006* • NPS 77, "Natural Resource Management Reference Manual #77"
Management Strategies	
• Complete an inventory of plants and animals in the national seashore and regularly monitor the distribution and condition (e.g., health, disease) of selected species that are (a) invasive exotics or (b) native species capable of creating resource problems (e.g., habitat decline due to overpopulation). • Undertake research to assess the methods by which exotic species become established and spread into native plant communities so that strategies for preventing introduction and establishment can be developed and implemented. Study the environmental and ecological effects of exotic species invasion to assess threats, develop long-term program for reversing threats, and prioritize management actions. • Control or eliminate exotic plants and animals, exotic diseases, and pest species where there is a reasonable expectation of success and sustainability. • Manage exclusively for native plant species in pristine and primitive management prescriptions. In other management prescriptions, limit planting of nonnative species to noninvasive plants that are justified by the historic scene or operational needs. • Provide interpretive and educational programs on the preservation of native species for visitors and for residents neighboring the national seashore.	

NATURAL RESOURCE MANAGEMENT STRATEGIES

GEOLOGIC PROCESSES AND RESOURCES	
Desired Conditions	**Sources**
The national seashore's geologic processes and resources are preserved and protected as integral components of the national seashore's natural systems.	• NPS *Management Policies 2006* • NPS 77, "Natural Resource Management Reference Manual #77"

Management Strategies

- Assess the impacts of natural processes and human-related events on geologic processes and resources.
- Maintain and restore the integrity of existing geologic processes and resources.
- Integrate geologic resources management into national seashore operations and planning.
- Develop a plan to address geologic research, inventory, and monitoring.
- Prepare a geologic inventory, including the identification of the significant geologic processes that shape national seashore ecosystems and the identification of the human influences on those geologic processes; identification of geologic hazards; inventory of type sections or type localities within the national seashore; inventory of "textbook" localities that provide particularly good or well-exposed examples of geologic features or events, and that may warrant special protection or interpretive efforts; and, identification of interpretive themes or other opportunities for interpreting the significant geologic events or processes that are preserved, exposed, or occur in the national seashore.
- Update geologic map of the national seashore in digital format that can be used in the national seashore's geographic information system (GIS).
- Update geologic interpretations of localities that are the subject of interpretive stops or displays and develop programs to educate visitors about geologic processes and resources.

SOILS	
Desired Conditions	**Sources**
The National Park Service actively seeks to understand and preserve the soil resources of the national seashore, and to prevent, to the extent possible, the unnatural erosion, physical removal, or contamination of the soil, or its contamination of other resources. Natural soil resources and processes function in as natural a condition as possible, except where special considerations are allowable under policy.	• NPS *Management Policies 2006* • NPS 77, "Natural Resource Management Reference Manual #77"

Management Strategies

- Collect baseline information on soils.
- Update soils map of the national seashore in digital format that can be used in the national seashore's geographic information system (GIS).
- Take actions to prevent or minimize adverse, potentially irreversible impacts on soils and implement soil conservation and soil amendment practices to reduce impacts as appropriate.
- Minimize soil excavation, erosion, and off-site soil migration during and after any ground-disturbing activity.
- Survey areas of the national seashore with soil resource problems and take actions appropriate to the management prescription to prevent or minimize further erosion, compaction, or deposition.
- Apply effective best management practices to problem soil erosion and compaction areas in a manner that stops or minimizes erosion, restores soil productivity, and reestablishes or sustains a self-perpetuating vegetative cover.
- Whenever possible, national seashore staff would educate visitors about soils.

NATURAL RESOURCE MANAGEMENT STRATEGIES

WATER RESOURCES	
Desired Conditions	**Sources**
Surface water and groundwater are protected and water quality meets or exceeds all applicable water quality standards. NPS and NPS-permitted programs and facilities are maintained and operated to avoid pollution of surface water and groundwater.	• Clean Water Act; Executive Order (EO) 11514 "Protection and Enhancement of Environmental Quality" • NPS *Management Policies 2006* • NPS 77, "Natural Resource Management Reference Manual #77"

Management Strategies

- Work with appropriate governmental bodies to obtain the highest possible water quality standards available under the Clean Water Act.
- Cooperate with other government agencies to maintain and/or restore quality of national seashore water resources.
- Take all necessary actions to maintain or restore the quality of surface and ground waters in the national seashore consistent with the Clean Water Act.
- Study the effects of the water quality on aquatic life.
- Promote water conservation by the National Park Service, concessioners, visitors, and national seashore neighbors.
- Apply best management practices to all pollution-generating activities and facilities in the national seashore, such as NPS maintenance and storage facilities and parking areas.
- Minimize the use of pesticides, fertilizers, and other chemicals and manage them in keeping with NPS policy and federal regulations.
- Continue to monitor the effects of visitor use.
- Continue to assess stormwater runoff.
- Promote greater public understanding of water resource issues at the national seashore and encourage public support for and participation in protecting the Davis Bayou watershed.
- Continue NPS water quality monitoring program.

NATURAL RESOURCE MANAGEMENT STRATEGIES

WETLANDS	
Desired Conditions	**Sources**
The natural and beneficial values of wetlands are preserved and enhanced. The National Park Service implements a "no net loss of wetlands" policy and strives to achieve a longer-term goal of net gain of wetlands across the national park system through the restoration of previously degraded wetlands. The National Park Service avoids to the extent possible the long- and short-term adverse impacts associated with the destruction or modification of wetlands and avoids direct or indirect support of new construction in wetlands wherever there is a practicable alternative. The National Park Service compensates for remaining unavoidable adverse impacts on wetlands by restoring wetlands that have been previously degraded.	• Clean Water Act • Rivers and Harbors Act • EO 11514 "Protection and Enhancement of Environmental Quality" • EO 11990; "Protection of Wetlands" • "Protecting America's Wetlands: A Fair, Flexible, and Effective Approach," White House Office on Environmental Policy, 1993 • NPS *Management Policies 2006* • DO 77-1, "Wetland Protection"
Management Strategies	
• Conduct or obtain wetland inventories to ensure proper planning, management, and protection of wetlands in the national seashore. • All facilities would be located to avoid wetlands if feasible. If avoiding wetlands was not feasible, other actions would be taken to comply with Executive Order 11990 ("Protection of Wetlands"), the Clean Water Act, and Director's Order 77-1 ("Wetland Protection"). • A "Statement of Findings" for wetlands will be prepared if the NPS actions would result in adverse impacts on wetlands. The "Statement of Findings" would include an analysis of the alternatives, delineation of the wetland, a wetland restoration plan to identify mitigation, and a wetland functional analysis of the impact site and restoration site. • Enhance natural wetland values by using them for educational and scientific purposes that do not disrupt natural wetland functions. • If natural wetland functions have been degraded or lost due to human action, the National Park Service will work to restore wetlands to pre-disturbance conditions, to the extent practicable.	

NATURAL RESOURCE MANAGEMENT STRATEGIES

FLOODPLAINS	
Desired Conditions	**Sources**
Natural floodplain values are preserved or restored. Long-term and short-term environmental effects associated with the occupancy and modification of the floodplain is avoided. When it is not practicable to locate or relocate development or inappropriate human activities to a site outside the floodplain or where the floodplain will be affected, the National Park Service • Prepares and approves a "Statement of Findings" in accordance with DO 77-2. • Uses nonstructural measures as much as practicable to reduce hazards to human life and property while minimizing impacts on the natural resources of floodplains. • Ensures that structures and facilities are designed to be consistent with the intent of the standards and criteria of the National Flood Insurance Program (44 CFR 60).	• Rivers and Harbors Act • EO 11988 "Floodplain Management" • Special Directive 93-4 "Floodplain Management, Revised Guidelines for National Park Service Floodplain Compliance" (1993) • National Flood Insurance Program (44 CFR 60) • NPS *Management Policies 2006* • Director's Order 77-2 *Floodplain Management*
Management Strategies	
• Establish flood awareness, preparedness, and warning system plans as necessary. • National seashore visitors would be made aware of hazards associated with flash flooding and informed of what to do in such situations. • Avoid development and location of visitor activities in floodplains to the extent practicable. Any future construction within floodplain will be accompanied by a "Statement of Findings" describing the need to develop within the maximum estimated flood (Q_{me}), the flood hazard associated with the proposed development site, and the plans for mitigation of this flood hazard.	

NATURAL RESOURCE MANAGEMENT STRATEGIES

AIR QUALITY

Gulf islands National Seashore is classified as a Class II area under the Clean Air Act. This air quality classification is the second most stringent and is designed to protect the majority of the country from air quality degradation. Air quality is monitored by the states of Florida and Mississippi at a number of stations outside of the national seashore.

Desired Conditions	Sources
Good to excellent air quality is maintained. Scenic views, both day and night, are protected and unimpaired for the enjoyment of current and future recreation area visitors.	• Clean Air Act • Florida and Mississippi air regulations • NPS *Management Policies 2006* • NPS 77, "Natural Resource Management Reference Manual #77"

Management Strategies

- Although the National Park Service has very little direct control over air quality in the airshed encompassing the national seashore, national seashore managers will continue to cooperate with the Florida Department of Environmental Protection (FDEP) and the Mississippi Department of Environmental Quality (MDEQ), Commission on Environmental Quality, and the U.S. Environmental Protection Agency on air quality issues.
- Minimize air quality pollution emissions associated with national seashore operations, including the use of prescribed fire and visitor use activities.
- Ensure healthful indoor air quality at NPS facilities.
- Participate in federal, regional, and local air pollution control plans and drafting of regulations and review permit applications for major new air pollution sources.
- Develop educational programs to inform visitors and regional residents about the threats of air pollution.
- Form regional partnerships to develop alternative transportation systems and promote clean fuels.
- Participate in research on air quality and effects of air pollution. Determine changes in national seashore ecosystem functions caused by atmospheric deposition and assess the resistance and resilience of native ecosystems in the face of these external perturbations.

NIGHT SKY

Desired Conditions	Sources
Excellent opportunities to see the night sky are available. Artificial light sources both within and outside the national seashore do not unacceptably adversely affect native species (such as sea turtle nesting and hatchlings) or visitor's opportunities to see the night sky.	• NPS *Management Policies 2006*

Management Strategies

- The National Park Service will cooperate with national seashore visitors, neighbors, and local government agencies to find ways to prevent or minimize the intrusion of artificial light into the night scene in the national seashore.
- In natural areas, artificial outdoor lighting will be limited to basic safety requirements and will be shielded when possible.
- The national seashore staff will evaluate the impacts on the night sky caused by national seashore facilities. If light sources in the national seashore are affecting night skies, the staff will study alternatives such as shielding lights, changing lamp types, or eliminating unnecessary sources. These management actions benefit wildlife as well as conserve valuable resources with more sustainable lighting design.

NATURAL RESOURCE MANAGEMENT STRATEGIES

NATURAL SOUNDSCAPES

An important part of the NPS mission is to preserve or restore the natural soundscapes associated with national park system units. The sounds of nature are among the intrinsic elements that combine to form the environment of our national park system units. Current laws and policies require that the following conditions be achieved in the national seashore:

Desired Conditions	Sources
The National Park Service preserves the natural ambient soundscapes, restores degraded soundscapes to the natural ambient condition wherever possible, and protects natural soundscapes from degradation due to human-caused noise. Disruptions from recreational uses are managed to provide a high-quality visitor experience in an effort to preserve or restore the natural quiet and natural sounds. Noise sources are managed to preserve or restore the natural soundscape.	• NPS *Management Policies 2006* • DO 47,"Sound Preservation and Noise Management" • Executive memorandum signed by President Clinton on April 22, 1996

Management Strategies

- Actions will be taken to monitor and minimize or prevent or minimize unnatural sounds that adversely affect national seashore resources or values or visitors' enjoyment of them.
- The national seashore staff continue to require tour bus companies to comply with regulations designed to reduce noise levels (e.g., turning off engines when buses are parked).
- Noise generated by NPS management activities will be minimized by strictly regulating administrative functions such as the use of motorized equipment. Noise will be a consideration in the procurement and use of equipment by the national seashore staff.
- Work with the Department of Defense to address noise concerns from military flights.
- Encourage visitors to avoid unnecessary noise, such as through the use of generators and maintaining quiet hours in the campgrounds.

CULTURAL RESOURCE MANAGEMENT STRATEGIES

ARCHEOLOGICAL RESOURCES	
Desired Conditions	**Sources**
Archeological sites area identified and inventoried and their significance is determined and documented. Archeological sites are protected in an undisturbed condition unless it is determined through formal processes that disturbance or natural deterioration is unavoidable. When disturbance or deterioration is unavoidable, the site is professionally documented and excavated and the resulting artifacts, materials, and records are curated and conserved in consultation with the appropriate SHPO and American Indian tribes. Some archeological sites that can be adequately protected may be interpreted to the visitor.	• National Historic Preservation Act of 1966, as amended (16 USC 470) • Executive Order 11593 • Archeological Resources Protection Act • Native American Graves Protection and Repatriation Act • 36 Code of Federal Regulations 79 – Curation of Archaeological Collections • The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation • 2008 Programmatic Agreement among the National Park Service, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers • NPS *Management Policies 2006* • Director's Order 28 "Cultural Resource Management Guideline"(1998) • Director's Order 28A "Archeology" (2004)

Management Strategies

- Complete a historic resource study for the national seashore that will outline the national seashore's major historic contexts (themes). Knowing the historic contexts will allow more detailed reports and National Register of Historic Places nominations to be written on the national seashore's archeological resources.
- Complete an Archeological Overview and Assessment for the national seashore.
- Complete a national seashorewide archeological resource survey including the properties within the terrestrial and marine environments. Document and evaluate archeological resources for their National Register of Historic Places eligibility. The most critical area for study is land where development or visitor activity is planned.
- Develop a strategy or plan to monitor, protect, and/or mitigate threats to archeological resources, including the potential discovery of human remains.
- Monitoring and assessment of archeological resource conditions would continue to be supported by the NPS Southeast Archeological Center.
- Rewrite or amend existing National Register of Historic Places nominations involving archeological sites to bring them up to current documentation standards, and include more recent scholarship on the significance of the resource.
- Determine which archeological sites should be added to the Archeological Sites Management Information System (ASMIS).
- Initiate a program of evaluation and nomination to the National Register of Historic Places those sites believed to be eligible for inclusion in and/or have had a consensus determination of eligibility already made.
- Educate visitors on regulations governing archeological resources encouraging them through the national seashore's interpretive programs to respect, and leave undisturbed, archeological resources.
- Monitor and assess condition of known archeological sites. Develop and implement stabilization strategies for sites being threatened or destroyed.
- Treat all archeological resources as eligible for listing on the National Register of Historic Places pending a formal determination by the National Park Service, the Florida and Mississippi State Historic Preservation Offices, and associated Indian tribes as to their significance.
- As appropriate, archeological surveys and/or monitoring would precede any ground disturbance activity. Known archeological resources would be avoided to the greatest extent possible. If National Register eligible or listed archeological resources could not be avoided, or if during construction previously unknown archeological resources were discovered and the resources could not be preserved in situ, an appropriate mitigation strategy would be developed in consultation with the appropriate state historic preservation officer and, if necessary, traditionally associated American Indian tribes.

CULTURAL RESOURCE MANAGEMENT STRATEGIES

PREHISTORIC/HISTORIC STRUCTURES/BUILDINGS	
Desired Conditions	**Sources**
Prehistoric/historic structures/buildings are inventoried and their significance and integrity are evaluated under National Register of Historic Places criteria. The qualities that contribute to the listing or eligibility for listing of historic properties on the National Register are protected in accordance with the *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation* (unless it is determined through a formal process that disturbance or natural deterioration is unavoidable).	• National Historic Preservation Act of 1966, as amended (16 USC 470) • Executive Order 11593 • Archeological and Historic Preservation Act • *The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation* • *The Secretary of the Interior's Standards for the Treatment of Historic Properties* • 2008 Programmatic Agreement among the National Park Service, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers • NPS *Management Policies 2006* • Director's Order 28 "Cultural Resource Management Guideline"(1998)

Management Strategies

- Complete a historic resource study for the national seashore that will outline the national seashore's major historic contexts (themes). Knowing the historic contexts will allow more detailed reports and National Register of Historic Places nominations to be written on the national seashore's prehistoric/historic structures/buildings.
- Update/certify the List of Classified Structures (LCS); identify and evaluate historic properties.
- Develop and initiate a program of nomination to the National Register of Historic Places for those properties believed to be eligible for the National Register of Historic Places and/or initiate a consensus determination of eligibility with the appropriate State Historic Preservation Office for those resources.
- Treat all historic structures as eligible for listing in the National Register of Historic Places pending a formal determination by the National Park Service, the Florida or Mississippi State Historic Preservation Office, and associated Indian tribes, as appropriate, as to their significance.
- Rewrite or amend existing National Register of Historic Places nominations involving prehistoric/historic structures/buildings to bring them up to current documentation standards, and include more recent scholarship on the significance of the resource.
- Determine, implement, and maintain the appropriate level of preservation for each historic structure formally determined or considered eligible for inclusion in the National Register of Historic Places (subject to the *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation*).
- Monitor and evaluate condition of historic structures and develop and implement stabilization strategies for buildings and structures being threatened.
- Before modifying any historic structure eligible for inclusion or listed in the National Register of Historic Places, the National Park Service will consult with the appropriate State Historic Preservation Office and the Advisory Council for Historic Preservation, as required.
- If disturbance to historic structures is unavoidable, conduct formal consultation with the Advisory Council on Historic Preservation as appropriate, and the Florida or Mississippi State Historic Preservation Office and Indian tribes in accordance with the National Historic Preservation Act and the 2008 Programmatic Agreement among the National Park Service, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers.

Cultural Resource Treatments Definitions

Preservation or Stabilization is the act or process of applying the measures necessary to sustain the existing form, integrity, and materials of a historic property. Work, including preliminary measures to protect and stabilize the property, generally focuses on ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction.

Rehabilitation or Adaptive Reuse is the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features that convey its historical, cultural, or architectural values.

Restoration is the act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period.

MUSEUM COLLECTIONS	
Desired Conditions	**Sources**
All museum collections (objects, specimens, and archival collections) are identified and inventoried, catalogued, documented, preserved, and protected, and provisions are made for their access to and use for exhibits, research, and interpretation, excepting irreplaceable items that will not be displayed or stored at Gulf Islands National Seashore.	• National Historic Preservation Act of 1966, as amended (16 USC 470) • Museum Properties Management Act of 1955, as amended • American Indian Religious Freedom Act • Archeological and Historic Preservation Act • Archeological Resources Protection Act • Native American Graves Protection and Repatriation Act • 36 Code of Federal Regulations 79 – Curation of Archaeological Collections • NPS *Management Policies 2006* • Director's Order 24 "NPS Museum Collections Management" (2008) • Director's Order 28 "Cultural Resource Management Guideline"(1998) • NPS Museum Handbook, Parts I, II and III • 2008 Programmatic Agreement among the National Park Service, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers

Management Strategies

- Complete a historic resource study for the national seashore that will outline the national seashore's major historic contexts (themes). Knowing the historic contexts will allow more detailed reports to be written on the national seashore's museum collections.
- Use NPS standards and guidelines on the display and care of artifacts to plan for exhibit areas facilities sufficient to meet current curation standards. The qualities that contribute to the significance of collections will be protected in accordance with established NPS standards.
- Scientific specimens in the national seashore's museum collection will be properly catalogued, documented, preserved, and protected following NPS museum collection management guidelines.
- Collections generated by scientific research, including permitted research, Gulf Coast Inventory and Monitoring research, and MS Canyon 252 oil spill research will be properly catalogued, documented, preserved, and protected following NPS museum collection management guidelines.

CULTURAL RESOURCE MANAGEMENT STRATEGIES

CULTURAL LANDSCAPES	
Desired Conditions	**Sources**
Cultural landscape inventories are conducted to identify landscapes potentially eligible for listing in the National Register of Historic Places and to assist in future management decisions for landscapes and associated resources, both cultural and natural. The management of cultural landscapes focuses on preserving the landscape's physical attributes, biotic systems, and uses when those uses contribute to its historical significance. The preservation, rehabilitation, or restoration of cultural landscapes would be undertaken in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes*.	• National Historic Preservation Act of 1966, as amended (16 USC 470) • Advisory Council on Historic Preservation's implementing regulations regarding the "Protection of Historic Properties" (36 CFR 800) • *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes* (1996) • NPS *Management Policies 2006* • Director's Order 28 "Cultural Resource Management Guideline"(1998) • 2008 Programmatic Agreement among the National Park Service, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers
Management Strategies	
• Complete a historic resource study for the national seashore that will outline the national seashore's major historic contexts (themes). Knowing the historic contexts will allow more detailed reports and National Register of Historic Places nominations to be written on the national seashore's cultural landscapes. • Prepare cultural landscape reports for cultural landscapes identified to determine historical significance, to support preservation needs, and to guide the rehabilitation and maintenance of cultural landscapes eligible under National Register criteria. • Rewrite or amend existing National Register of Historic Places nominations involving cultural landscapes to bring them up to current documentation standards, and include more recent scholarship on the significance of the resource. • Submit the inventory and evaluation results to the state or tribal historic preservation officer for review and comment; forward final nomination form to the Keeper of the National Register of Historic Places with recommendations for eligibility to the National Register. • Determine and implement the appropriate level of treatment, in accordance with the *Secretary of the Interior's Standards*, for each landscape listed in or eligible to be listed in the National Register.	

CULTURAL RESOURCE MANAGEMENT STRATEGIES

ETHNOGRAPHIC RESOURCES	
Desired Conditions	**Sources**
Certain contemporary American Indian and other communities are permitted by law, regulation, or policy to pursue customary religious, subsistence, and other cultural uses of national seashore resources with which they are traditionally associated. Recognizing that its resource protection mandate affects this human use and cultural context of national seashore resources, the National Park Service plans and executes programs in ways that safeguard cultural and natural resources while reflecting informed concern for contemporary peoples and cultures traditionally associated with them.	• National Historic Preservation Act of 1966, as amended (16 USC 470) and Advisory Council on Historic Preservation implementing regulations • American Indian Religious Freedom Act • Native American Graves Protection and Repatriation Act • E.O. 13007 on American Indian Sacred Sites • Presidential Memorandum of April 29, 1994, on Government-to-Government Relations with Tribal Governments • NPS *Management Policies 2006* • Director's Order 28 "Cultural Resource Management Guideline"(1998) • 2008 Programmatic Agreement among the National Park Service, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers

Management Strategies

- Conduct consultation with affiliated American Indian tribes throughout the course of the planning process for this document.
- Complete an ethnographic overview and assessment of the national seashore. This should include a complete assessment of the related history of African-Americans in and near the national seashore, such as the early workers who helped build several of the 19th century forts and the worked the land that became Naval Live Oaks Reservation; the sailors and soldiers who participated in the War of 1812 and the Civil War; and the 20th century beach-goers who were restricted to "blacks only" beaches such as the one at Perdido Key named after Private Rosamond Johnson who was killed during the Korean Conflict in 1950.
- Continue to provide access to sacred sites and national seashore resources by American Indians when the use is consistent with seashore purposes and the protection of resources.
- Treat all ethnographic resources as eligible for listing in the National Register of Historic Places pending a formal determination by the Florida and Mississippi state historic preservation officers as to their significance.
- Protect all ethnographic resources determined eligible for listing in, or listed in, the National Register; if disturbance to such resources is unavoidable, conduct formal consultation with the Florida and Mississippi state historic preservation officers and the Advisory Council on Historic Preservation as appropriate in accordance with the provisions of the National Historic Preservation Act.
- Conduct regular consultations with affiliated tribes to continue to improve communications and resolve any problems or misunderstandings that occur.
- Provide access to, and use of, natural and cultural resources in the national seashore and collections by American Indians that are consistent with national seashore purposes, do not unreasonably interfere with American Indian use of traditional areas or sacred resources, and do not degrade national seashore resources.
- Continue to encourage employment of American Indians on the national seashore staff to improve communications and working relationships and encourage cultural diversity in the workplace.

VISITOR USE MANAGEMENT STRATEGIES

VISITOR USE

Current laws, regulations, and policies leave considerable room for judgment about the best mix of types and levels of visitor use activities, programs, and facilities. For this reason, most decisions related to visitor experience and use are addressed in the alternatives. However, all visitor use of national park system units must be consistent with the following guidelines.

Desired Conditions	Sources
National seashore resources are conserved "unimpaired" for the enjoyment of future generations. Visitors have opportunities for forms of enjoyment that are uniquely suited and appropriate to the superlative natural and cultural resources found in the national seashore. No activities occur that would cause derogation of the values and purposes for which the national seashore has been established. For all zones, districts, or other logical management divisions within a national park system unit, the types and levels of visitor use are consistent with the desired resource and visitor experience conditions prescribed for those areas within the unit's purpose. National seashore visitors will have opportunities to understand and appreciate the significance of the national seashore and its resources, and to develop a personal stewardship ethic by directly relating to the resources. To the extent feasible, programs, services, and facilities in the national seashore are accessible to and usable by all people, including those with disabilities within an atmosphere accessible to every segment of American society.	• NPS Organic Act • National Park System General Authorities Act • NPS *Management Policies 2006* • Title 36 *Code of Federal Regulations* • Architectural Barriers Act of 1968 • Americans with Disabilities Act of 1990 • 28CFR36 • Architectural Barriers Act Accessibility Standards 2006 • U.S. Access Board Draft Accessibility Guidelines for Outdoor Developed Areas of 1999 • NPS *Management Policies 2006* • DO-42, *Accessibility for Visitors with Disabilities in NPS Programs, Facilities, and Services* • Rehabilitation Act of 1973 • Secretary of the Interior's regulation 43CFR17, *Enforcement on the Basis of Disability in Interior Programs*;

Management Strategies

- Provide a range of opportunities for visitors to understand, appreciate, and enjoy the national seashore and its natural and cultural resources.
- National seashore staff will continue to monitor visitor comments on such issues as crowding, encounters with other visitors in the backcountry, availability of backcountry campsites during busy times of the year, availability of parking, etc.
- National seashore staff will conduct periodic visitor surveys to stay informed of changing visitor demographics and desires to better tailor programs to visitor needs, desires, and interests.
- Ensure that all national seashore programs and facilities are accessible to the extent feasible and consistent with legal and policy requirements.
- Continue to enforce the regulations promulgated in 36 CFR with regard to visitor use limitations.
- Develop strategies to ensure that all new and renovated buildings/facilities, programs, activities, and services, including those provided/offered by concessioners, are designed and constructed in accordance with applicable rules, regulations, and standards. Existing buildings/facilities, programs, activities, and services will be evaluated to determine the degree to which they are currently accessible to and usable by people with disabilities, identify barriers that limit access, and develop strategies for removing those barriers.

VISITOR USE MANAGEMENT STRATEGIES

VISITOR ACCESS

Desired Conditions	Sources
Visitors have reasonable access to the national seashore, and there are connections from the national seashore to regional transportation systems as appropriate. Transportation facilities in the national seashore provide access for the protection, use, and enjoyment of national seashore resources. They preserve the integrity of the surroundings, respect ecological processes, protect national seashore resources, and provide the highest visual quality and a rewarding visitor experience. The National Park Service participates in all transportation planning forums that may result in links to national seashore or impact national seashore resources. Working with federal, tribal, state, and local agencies on transportation issues, the National Park Service seeks reasonable access to national seashore, and connections to external and alternative transportation systems.	• NPS *Management Policies 2006* • NPS *Transportation Planning Guidebook*

Management Strategies

- Work with gateway communities and local, regional, state, tribal, and federal agencies to develop a regional approach to transportation planning between local communities and national seashore units. Encourage a multiagency, multicounty regional transportation planning group.
- Work with the U.S. Department of Transportation, the Federal Highway Administration, the Florida and Mississippi Departments of Transportation, and other sources to seek funding and staff to participate in and encourage effective regional transportation planning and enhancements, including both road and nonroad transportation (e.g., bikeways, road signs, trails, intelligent transportation systems, historic preservation, recreational access and facility development, visitor centers, traffic calming devices, gateway community enhancements).
- Encourage, where appropriate, alternative transportation systems that contribute to maximum visitor enjoyment of and minimum adverse impacts on national seashore resources and values.
- Advocate for corridor crossings for wildlife and other accommodations to promote biodiversity.
- Avoid or mitigate harm to individual animals, fragmentation of habitats, and the disruption of natural systems.

BACKCOUNTRY USE

Desired Conditions	Sources
Backcountry use is managed in accordance with a backcountry management plan (or other plan addressing backcountry uses) that is designed to avoid inappropriate impacts on national seashore resources or adverse effects on visitor enjoyment of appropriate recreational experiences. The National Park Service seeks to identify acceptable limits of impacts, monitors backcountry use levels and resource conditions, and takes prompt corrective action when excessive impacts occur.	• NPS *Management Policies 2006*

Management Strategies

- The national seashore's backcountry management plan will be finalized to avoid inappropriate impacts on national seashore resources or adverse effects on visitor enjoyment of appropriate recreational experiences.
- Special attention will be paid to occupancy limits in backcountry and wilderness island settings.

VISITOR USE MANAGEMENT STRATEGIES

WILDERNESS	
Desired Conditions	**Sources**
The National Park Service will manage designated wilderness areas for the use and enjoyment of the American people in such a manner as will leave them unimpaired for future use and enjoyment as wilderness. The national seashore ensures that wilderness characteristics and values are retained and protected, that visitors continue to find opportunities for solitude and primitive, unconfined recreation, and that signs of people remain substantially unnoticeable.	• NPS *Management Policies 2006* • DO 41 "Wilderness Preservation and Management" • Wilderness Act of 1964 • Public Law 95-265

Management Strategies

- If new areas are added to a NPS unit, a wilderness suitability assessment will be prepared if appropriate. Should areas be determined suitable, a wilderness study will be prepared.
- Areas proposed/recommended for wilderness will continue to be managed so as to not diminish their wilderness characteristics until Congress has taken action on the proposal/recommendation.
- Uses that are in keeping with the definitions and purpose of wilderness, and do not degrade wilderness resources and character, will be encouraged. Appropriate restrictions may be imposed on any authorized activity to preserve wilderness character and resources, or to ensure public safety.
- Each national seashore containing wilderness resources will develop and maintain a wilderness management plan or equivalent planning document to guide the preservation, management, and use of these resources.
- Managers considering the use of aircraft or other motorized equipment or mechanical transportation within wilderness must consider impacts on the character, aesthetics, and traditions of wilderness before considering the costs and efficiency of the equipment.
- All management decisions affecting wilderness must be consistent with the minimum requirement concept: a proposed management action must be appropriate or necessary for administration of the area as wilderness and not pose a significant impact on wilderness resources and character, and the management method (tools) used must cause the least amount of impact on the wilderness resources and character. Administrative use of motorized equipment or mechanical transport will be authorized only if the superintendent determines it is the minimum requirement needed to achieve the purposes of the area as wilderness, or it is needed in an emergency situation involving the health or safety of persons actually within the area.
- In evaluating environmental impacts, the National Park Service will take into account wilderness characteristics and values, including the primeval character and influence of the wilderness; the preservation of natural conditions (including the lack of man-made noise); and assurances that there will be outstanding opportunities for solitude, that the public will be provided with a primitive and unconfined type of recreational experience, and that wilderness will be preserved and used in an unimpaired condition. Managers will be expected to appropriately address cultural resources management considerations in the development and review of environmental compliance documents for actions that might impact wilderness resources.
- Scientific activities will be encouraged and permitted when consistent with NPS responsibilities to preserve and manage wilderness.
- Wilderness education/interpretive programs will be used to inform visitors about wilderness ethics and how to minimize their impacts on wilderness. Leave-no-trace practices will be emphasized.

VISITOR USE MANAGEMENT STRATEGIES

COMMERCIAL SERVICES

Commercial services are another way of providing for the visitor experience and use previously described. Commercial operators are "partners" with the National Park Service to provide goods and services to visitors that are necessary and appropriate but not provided by NPS personnel. The National Park Service manages commercial service levels and types to achieve the same resource protection and visitor experience conditions required by the NPS Organic Act, General Authorities Act, management policies, and other regulations and policies. In addition, commercial services must comply with the provisions of the NPS Concessions Management Improvement Act of 1998. By law, all commercial activities in national park system units must be authorized in writing by the superintendent. A commercial activity is defined as any activity for which compensation is exchanged. It includes activities by for-profit and nonprofit operators. Commercial services are more than just concessions. They include concession contracts, commercial use authorizations, leases, cooperative agreements, rights of way, and special use permits. All commercial services must be managed. All commercial services must be necessary and/or appropriate by achieving the resource protection and visitor use goals for the national seashore unit.

Desired Conditions	Sources
All commercial services must be authorized, must be necessary and/or appropriate, and must be economically feasible. Appropriate planning must be done to support commercial services authorization. Same as Visitor Experience and Use (described earlier)	• NPS *Management Policies 2006* • NPS Concessions Management Improvement Act of 1998 • Same as Visitor Experience and Use

Management Strategies

- Establish and document that all commercial services in the national seashore unit are necessary and/or appropriate before they are proposed or reauthorized.
- Ensure that all necessary and/or appropriate commercial activities in the national seashore unit are authorized in writing by the superintendent.
- Stop all unauthorized commercial activities in the national seashore unit.
- Use the most appropriate authorization tool (concession contracts, commercial use authorizations, leases, cooperative agreements, rights of way, and special use permits) to manage the commercial services program effectively and efficiently.
- Ensure that all commercial activities in the national seashore unit provide high-quality visitor experiences while protecting important natural, cultural, and scenic resources.
- Ensure that new or modified concessions are economically feasible and that the operator has a reasonable opportunity to make a profit before they are proposed in a planning document.
- Establish levels of commercial use that are consistent with resource protection and visitor experience goals for the national seashore unit and do not unduly interfere with the independent visitor's ability to participate in the same activity.
- Ensure that all commercial services are safe and sustainable.
- Authorize only those commercial services that are not or cannot be made available within a reasonable distance outside the national seashore unit.
- Prepare a commercial services plan if necessary to describe in detail the actions required to achieve commercial services and related visitor experience goals.

VISITOR USE MANAGEMENT STRATEGIES

PUBLIC HEALTH AND SAFETY

NPS *Management Policies 2006* state that the saving of human life will take precedence over all other management actions as the Park Service strives to protect human life and provide for injury-free visits. Current laws and policies require that the following conditions be achieved in the national seashore:

Desired Conditions	Sources
While recognizing that there are limitations on its capability and constraints imposed by the Organic Act to not impair resources, the service and its concessioners, contractors, and cooperators will seek to provide a safe and healthful environment for visitors and employees. The national seashore staff will strive to identify recognizable threats to safety and health and protect property by applying nationally accepted standards. The national seashore staff will reduce or remove known hazards and/or apply appropriate mitigating measures, such as closures, guarding, gating, education, and other actions.	• OSHA 29CFR • NPS *Management Policies 2006* • DO-50 and RM-50 "Safety and Health" • DO-58 and RM-58 "Structural Fire Management" • DO-83 and RM-83 "Public Health" • DO-51 and RM-51 "Emergency Medical Services" • DO-30 and RM-30 "Hazard and Solid Waste Management

Management Strategies

- Maintain a current hurricane evacuation plan.
- Establish a documented safety program in the national seashore to address health and safety concerns and identify appropriate levels of action and activities.
- Ensure that all potable water systems and waste water systems in the national seashore meet state and federal requirements.
- Provide for interpretive signs and materials to notify visitors of potential safety concerns, hazards, and procedures to help provide for a safe visit to the national seashore and to ensure that visitors are aware of possible risks of certain activities.
- Maintain memorandums of understanding with local municipalities to provide structural fire support.
- Develop an emergency preparedness program to maximize visitor and employee safety and protection of resources and property.
- Develop an emergency operations plan including a hazardous spill response plan to plan for and respond to spills.
- Provide a search and rescue program to make reasonable efforts to search for lost persons and rescue sick, injured, or stranded persons.
- Provide an emergency medical services program to provide for the care of the ill and injured, including emergency pre-hospital care and the emergency medical transport of sick and injured by hospital from the national seashore's remote setting to medical help.

OTHER MANAGEMENT STRATEGIES

SUSTAINABILITY

Sustainability can be described as doing things in ways that do not compromise the environment or its capacity to provide for present and future generations. Sustainable practices consider local and global consequences to minimize the short- and long-term environmental impacts of human actions and developments through alternative energy sources, resource conservation, recycling, waste minimization, and the use of energy efficient and ecologically responsible materials and techniques.

Desired Conditions	Sources
National Park Service and facilities are harmonious with national seashore resources, compatible with natural processes, aesthetically pleasing, functional, as accessible as possible to all segments of the population, energy-efficient, and cost-effective. All decisions regarding operations, facilities management, and development in the national seashore, reflect principles of resource preservation. Thus, all national seashore developments and operations are sustainable to the maximum degree possible and practical. The national seashore has state-of-the-art water systems for conserving water, and uses energy conservation technologies, and renewable energy sources such as solar and wind energy and alternative fuel sources whenever possible. Biodegradable, nontoxic, and durable materials are used in the national seashore whenever possible. The reduction, use, and recycling of materials is promoted, while materials that are nondurable, environmentally detrimental, or that require transportation from great distances are avoided as much as possible. New developments and existing facilities are located, built, and modified according to the *Guiding Principles of Sustainable Design* (NPS 1993), LEED, or other similar guidelines.	• Executive Order 12873 mandates federal agency recycling and waste prevention • Executive Order 12902 mandates energy efficiency and water conservation at federal facilities • NPS *Management Policies 2006* • NPS *Guiding Principles of Sustainable Design* (1993) • Leadership in Energy & Environmental Design (LEED)

Management Strategies

The NPS *Guiding Principles of Sustainable Design* (1993b) directs NPS management philosophy. It provides a basis for achieving sustainability in facility planning and design, emphasizes the importance of biodiversity, and encourages responsible decisions. The guidebook articulates principles to be used in the design and management of tourist facilities that emphasize environmental sensitivity in construction, the use of nontoxic materials, resource conservation, recycling, and integrating visitors with natural and cultural settings. Sustainability principles have been developed and are followed for interpretation, natural resources, cultural resources, site design, building design, energy management, water supply, waste prevention, and facility maintenance and operations. In addition to following these principles, the following also will be accomplished:

- NPS staff will work with experts both inside and outside the National Park Service to make the national seashore's facilities and programs sustainable. Partnerships will be sought to implement sustainable practices in the national seashore. NPS staff also will work with stakeholders and business partners to augment NPS environmental leadership and sustainability efforts.
- NPS staff will support and encourage the service of suppliers and contractors that follow sustainable practices.
- Energy-efficient practices and renewable energy sources such as solar and wind energy and alternative fuel sources will be implemented wherever possible for both operational facilities and visitor facilities and amenities.
- The national seashore's interpretive programs will mention sustainable and nonsustainable practices. Visitors will be educated on the principles of environmental leadership, alternative energy, and sustainability through exhibits, media, and printed material.
- NPS employees will be educated to have a comprehensive understanding of their relationship to environmental leadership and sustainability. Explore and establish alternative transportation options for staff and visitors, such as bicycle lanes and parking, shuttle or trolley service, and ferry service. Explore use of low-emissions vehicles and biofuels for operations. Encourage partners and concessionaires to provide or use alternative transportation.

OTHER MANAGEMENT STRATEGIES

CLIMATE CHANGE

Climate change is expected to affect the national seashore's weather, resources (e.g., shorelines, vegetation, fish and wildlife, historic structures, and submerged cultural resources), facilities (e.g., docks and roads), and visitors (e.g., seasonal use patterns, recreational fishing, navigational hazards, and visitor opportunities). These changes are expected to have direct implications on resource management and park operations, and on the way visitors use and experience the national seashore. Although it is highly likely that climate change will affect the park during the life of this plan, many of the specific effects, the rate of changes, and the severity of impacts are not known.

Desired Conditions	Sources
Gulf Islands National Seashore is a leader in its efforts to address climate change, reducing the contribution of seashore operations and visitor activities on climate change, preparing for and mitigating climate change impacts, and increasing its use of alternative transportation, renewable energy, and other sustainable practices. Seashore staff proactively monitor and mitigate for climate change impacts on cultural and natural resources and visitor amenities. Education and interpretive programs help seashore visitors understand climate change impacts in the national seashore and beyond, and how they can respond to climate change. Visitors and staff are provided opportunities to use alternative transportation to work in and enjoy the seashore amenities. Partnerships with a variety of agencies and institutions allow seashore staff to remain current and participate in research on and mitigation of major climate change impacts in the national seashore such as those related to hurricanes, barrier island migration, and coastal erosion. Seashore staff promote best practices and adaptive management to respond to the challenges of climate change and its effects on park resources and the visitor experience.	• NPS Organic Act • Executive Order 13423 (includes requirements for the reduction of greenhouse gases and other energy and water conservation measures) • Department of the Interior Secretarial Order 3226 • NPS *Management Policies 2006* (including sections on environmental leadership [1.8], sustainable energy design [9.1.1.6], and energy management [9.1.7]) • NPS Environmental Quality Division *draft* Guidance on Considering Climate Change in NEPA • NPS Limate Change Response Strategy

Management Strategies

- Identify key natural and cultural resources and visitor amenities that are at risk from climate change. Establish baseline resource conditions, identify thresholds, and monitor for change. For example, research sea level rise predictions and overlay them on a map of sensitive park resources and visitor amenities to identify areas with a higher likelihood of impacts from coastal erosion, storm surge, and severe weather events.
- Incorporate the best available scientific climate change data and modeling into specific management decisions or actions.
- Assess, plan, and manage resources at multiple scales, both site-specific and seashorewide, for realistic outcomes. Planning might include climate change scenario planning, participation in the NPS Climate Friendly Parks program, or adherence to future "green parks plans" or NPS guidance. Identify key resources in various management zones/areas (e.g. wilderness, recreational beaches, seagrass protection, or seashore operations) that may require different management responses to climate change impacts. Form partnerships with other resource management entities to maintain regional habitat connectivity and refugia that allow species dependent on park resources to better adapt to changing conditions.
- Use best management practices to reduce human-caused stresses (e.g., seashore operations and visitor-related disturbances) that hinder the ability of species or ecosystems to withstand the impacts of climate change. Increase reliance on adaptive management to minimize risks to park resources; alter management actions when current information becomes available.
- Use the dynamic environment of the Gulf Coast as a teaching opportunity about climate change. Educate visitors about climate change and related research and partnership efforts at the national seashore, and climate change impacts on the resources they are enjoying. Inspire visitors to action and response through leadership and education.
- 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 will improve, and they will have an increased ability to recover from or resist the impacts of climate change. (Strategies adapted from International Human Dimensions Programme on Global Environmental Change, 2008.)

OTHER MANAGEMENT STRATEGIES

COMMUNITY AND AGENCY RELATIONS	
Desired Conditions	**Sources**
The national seashore is managed as part of a greater ecological, social, economic, and cultural system. Good relations are maintained with adjacent landowners, surrounding communities, and private and public groups that affect, and are affected by, the national seashore. The national seashore is managed proactively to resolve external issues and concerns and ensure that national seashore values are not compromised. Because the national seashore is an integral part of larger regional environment, the National Park Service works cooperatively with others to anticipate, avoid, and resolve potential conflicts, protect national seashore resources, and address mutual interests in the quality of life for community residents. Regional cooperation involves federal, state, and local agencies, Indian tribes, neighboring landowners, and all other concerned parties.	• NPS *Management Policies 2006*
Management Strategies	
• Continue to establish and foster partnerships with public and private organizations to achieve the purpose of the national seashore. Partnerships will be sought for resource protection, research, education, and visitor enjoyment. • NPS staff will keep landowners, land managers, local governments, and the general public informed about national seashore management activities. Periodic consultations will occur with landowners and communities affected by national seashore visitors and management actions. The National Park Service will work closely with local, state, and federal agencies and tribal governments whose programs affect or are affected by activities in the national seashore. • Periodic consultations will occur with landowners and communities who are affected by, or potentially affected by national seashore visitors and management actions. National seashore staff will respond promptly to conflicts that arise over their activities, visitor access, and proposed activities and developments on adjacent lands that may affect the national seashore. National seashore managers will seek agreements with landowners to encourage their lands to be managed in a manner compatible with national seashore purposes. National seashore staff also will seek ways to provide landowners with technical and management assistance to address issues of mutual interest.	

LAND PROTECTION	
Desired Conditions	**Sources**
Land protection plans are prepared to determine and publicly document what lands or interests in land need to be in public ownership, and what means of protection are available to achieve the purposes for which the national seashore was established.	• NPS *Management Policies 2006*
Management Strategies	
Prepare and implement an updated land protection plan for the national seashore.	

OTHER MANAGEMENT STRATEGIES

CULTURALLY AFFILIATED TRIBAL RELATIONS

Desired Conditions	Sources
The National Park Service and tribes culturally affiliated with the national seashore maintain positive, productive, government-to-government relationships. National seashore managers and staff respect the viewpoints and needs of the tribes, continue to promptly address conflicts that occur, and consider American Indian values in national seashore management and operation.	• National Historic Preservation Act of 1966, as amended (16 USC 470) • Archeological Resources Protection Act • Native American Graves Protection and Repatriation Act • American Indian Religious Freedom Act • NPS *Management Policies 2006* • NPS Organic Act • National Environmental Policy Act • Executive Order 12007 "Sacred Sites"

Management Strategies

- Continue to cooperate with tribes in conducting ethnographic studies to better understand which tribes are culturally affiliated with the national seashore and identify culturally significant resources.
- Continue regular consultations with affiliated tribes to continue to improve communications and resolve any problems or misunderstandings.
- Continue to encourage the employment of American Indians on national seashore staff to improve communications and working relationships, and encourage cultural diversity in the workplace.
- Consider culturally affiliated tribal values in efforts to improve overall management and national seashore interpretation.
- Implement a joint monitoring program to monitor plant-gathering sites for potential impacts.

UTILITY AND COMMUNICATION FACILITIES

Desired Conditions	Sources
National seashore resources or public enjoyment of the national seashore are not denigrated by nonconforming uses. Telecommunication structures are permitted in the national seashore o the extent that they do not jeopardize the national seashore's mission and resources. No new nonconforming use or rights-of-way are permitted through the national seashore without specific statutory authority and approval by the director of the National Park Service or his representative, and are permitted only if there is no practicable alternative to such use of NPS lands.	• Telecommunications Act; 16 USC 79; 23 USC 317; 36 CFR 14 • NPS *Management Policies 2006;* DO 53A, "Wireless Telecommunications" • Reference Manual 53, "Special Park Uses."

Management Strategies

The Telecommunications Act of 1996 directs all federal agencies to assist in the national goal of achieving a seamless telecommunications system throughout the United States by accommodating requests by telecommunication companies for the use of property, rights-of-way, and easements to the extent allowable under each agency's mission. The National Park Service is legally obligated to permit telecommunication infrastructure in the national seashore if such facilities can be structured to avoid interference with national seashore purposes.

- Locate new or reconstructed utilities and communications infrastructures in association with existing structures and along roadways or other established corridors in developed areas. For reconstruction or extension into undisturbed areas, select routes that will minimize impacts on the national seashore's natural, cultural, and visual resources.
- Place utility lines underground to the maximum extent possible.
- Work with service companies, local communities, and the public to locate new utility lines so that there is minimal effect of national seashore resources.
- Follow NPS policies in processing applications for commercial telecommunications applications.

BOUNDARY ADJUSTMENTS

As part of general management planning, the National Park Service is required to identify and evaluate boundary adjustments that may be necessary or desirable to carry out the purposes of the park unit. Boundary adjustments may be recommended to

1) protect significant resources and values, or to enhance opportunities for public enjoyment related to park purposes,

2) address operational and management issues, such as the need for access or the need for boundaries to correspond to logical boundary delineations such as topographic or other natural features or roads, or

3) otherwise protect park resources that are critical to fulfilling park purposes.

Additionally, all recommendations for boundary changes must meet the following two criteria:

4) The added lands will be feasible to administer considering their size, configuration, and ownership; costs; the views of and impacts on local communities and surrounding jurisdictions; and other factors such as the presence of hazardous substances or exotic species.

5) Other alternatives for management and resource protection are not adequate.

During scoping for this *General Management Plan*, some members of the public suggested specific areas to consider including within the boundaries of Gulf Islands National Seashore. The properties identified included other northern Gulf Coast fortifications as well as other barrier islands within Alabama.

For a boundary adjustment to be recommended, at least one of criteria 1– 3 above must be met, as well as meeting both criteria 4 and 5. Although it is possible that criteria 1 could be met, it does not appear to be feasible to expand management responsibilities at this time. Boundary adjustments to the national seashore are not being considered under this planning process because efforts to acquire lands within the existing boundary have yet to be completed. Consideration of managing and maintaining current holdings is considered a higher priority for the foreseeable future.

RELATIONSHIP OF THE GENERAL MANAGEMENT PLAN TO OTHER PLANNING EFFORTS

Several plans for areas within or near the national seashore could influence or be influenced by actions presented in this *General Management Plan / Environmental Impact Statement* and must be considered. These relevant plans and studies are listed below.

NPS MANAGEMENT PLANS AND STUDIES

Fort Pickens / Gateway Community Alternative Transportation Plan

In February 2009 the national seashore, in cooperation with the Federal Highway Administration Eastern Federal Lands Highway Division, completed an alternative transportation study to assess the current and future transportation needs of Fort Pickens and the nearby gateway community and identify potential alternative transportation systems capable of meeting those needs. Although water transportation and docking systems to connect various locations in the Florida District of the national seashore were identified in the 1978 *General Management Plan*, none were implemented. Several planning and study efforts have been undertaken since that time.

Support for ferry service in the Pensacola Bay area is long standing and supported by projects such as the Maritime Museum and Maritime Park development. The Santa Rosa Island Authority, the regional metropolitan planning organization, and the local transit authority are among those who support the current efforts to establish ferry service in the bay. A strategy for supplementing the road with alternative transportation systems is essential to providing consistent public access to the Fort Pickens Area in the future. Improved transportation options to the Fort Pickens Area could reduce congestion and parking demand while maintaining visitation. The implementation of alternative transportation systems also could protect natural and cultural resources and reduce impacts on the environment.

Fire Management Plan

A comprehensive *Fire Management Plan*, along with an associated environmental assessment and "Finding of No Significant Impact," was completed in February 2010. The plan addressed national seashore wildland and prescribed fire management goals, objectives, and actions for both the Florida and Mississippi districts. The plan is designed to provide direction, guidance, and priorities for fire management over a 10-year period.

Collections Management Plan

A "Draft Collections Management Plan," including a statement of collections, was completed in May 2007. Because of the transfer of the majority of artifacts and museum objects to off-site facilities, some modification to the plan is still required before it can be approved. Off-site curation and storage facilities include Timucuan Ecological and Historic Preserve, the NPS Southeast Archeological Center, the Naval Air Station at Pensacola, Louisiana State Univerity, and the University of West Florida. In the regional collections management plan developed in 2006, the NPS Southeast Regional Office identified the need for a joint, multipark collections facility to eventually be administered at Natchez National Historical Park. To date, funding has not been secured for this facility, so subsequent to the 2004-2005 hurricanes, the national seashore continues to store most accessioned museum objects at the five facilities identified above.

Personal Watercraft Use Environmental Assessment

Personal watercraft use was banned at Gulf Islands National Seashore on April 23, 2002, in compliance with an NPS regulation prohibiting personal watercraft use in most park units and a subsequent court settlement. In 2004 the National Park Service completed an environmental assessment for the purpose of evaluating a range of alternatives and strategies for the management of personal watercraft use within the national seashore. The effort resulted in a recommendation to reinstate personal watercraft use under a special NPS regulation with additional management prescriptions. In 2007, a special rule was promulgated to allow personal watercraft use in all areas of the park with restrictions.

Wilderness Management Plan

In 2004 the national seashore prepared a *Wilderness Management Plan* to guide management of the congressionally designated Gulf Islands Wilderness on Horn and Petit Bois islands. All land on Horn Island (3,650 acres) is wilderness or potential wilderness. The potential wilderness area includes privately owned tracts, lands partially owned by the federal government, and an administrative enclave at the ranger station. On Petit Bois Island (1,466 acres), all land is wilderness. The plan identifies crowding as a potential concern and identifies a number of options that management could implement. The alternatives in this *General Management Plan / Environmental Impact Statement* provide for more specific management options to address this issue.

OTHER AGENCY PLANS

Mississippi Coastal Improvement Program (MsCIP)

In response to destruction from Hurricane Katrina, Congress charged the U.S. Army Corps of Engineers with recommending improvements in coastal Mississippi for: (1) reducing future hurricane damage, (2) preventing salt water intrusion, (3) preserving fish and wildlife, (4) preventing erosion, and (5) supporting other water resource purposes. In addition, the governor of Mississippi has recommended returning Mississippi's barrier islands to pre-Hurricane Camille (1969) conditions to reduce future mainland storm surges. Four of the barrier islands, and a portion of a fifth, are within Gulf Islands National Seashore.

The MsCIP plan includes a restoration alternative that was developed for the Mississippi barrier islands within Gulf Islands National Seashore. This alternative includes (1) littoral zone deposition of acceptable beach-quality sediment in appropriate volumes, locations, frequencies, etc. near Petit Bois, Horn, and East Ship islands, (2) one or perhaps two small-scale (100,000–200,000 cubic yards) sediment deposition projects on the Mississippi Sound shoreline of East and West Ship islands to protect historic Fort Massachusetts and the French Warehouse archeological site, and (3) the one-time direct deposition of acceptable beach-quality sediment in a phased approach to further the restoration of the narrow, low sand spit that historically connected East and West Ship islands. The primary objectives of this alternative are to restore the entire barrier island sediment budget and transport system that has been disrupted by the human-made activities conducted near these islands, facilitate the restoration of the Ship Islands to a natural condition, and reduce erosion threats to significant cultural resources.

Based on NPS review of available scientific information, it is believed that the objectives and the components discussed above are consistent with NPS mandates and policies.

Recommendations concerning restoration of the barrier islands were included in the Mississippi Coastal Improvement Program's *Draft Comprehensive Plan / Draft Integrated Programmatic Environmental Impact Statement*. The final report was submitted to Congress in January 2010.

Marine Protected Area Planning

In April 2009 the Department of Interior and the National Oceanic and Atmospheric Administration announced the formation of the National System of Marine Protected Areas. Executive Order 13158 directed the agencies to establish "a scientifically based comprehensive national system of Marine Protected Areas representing diverse marine ecosystems and the nation's natural and cultural resources." Some national park system units were nominated for inclusion in the system in 2009 and 2010; Gulf Islands National Seashore may be included in a future nomination in the next several years.

Inclusion in the National System of Marine Protected Areas does not change how parks or other sites are managed or interfere with the independent exercise of agency authorities. Management of a national park system unit remains the prerogative of the National Park Service, the Department of Interior, and the states where parks are located. However, inclusion in the system highlights the biological and recreational values of ocean and coastal parks and enhances interagency cooperation between the National Park Service and state and federal partners. The national system is designed to bring some rigor and understanding of which species, habitats, cultural resources, and ecosystem types are currently represented in state and federal managed areas. A gap analysis and strategic effort will follow to define how the nation's marine resources could be better represented and protected using marine protected areas as management tools, either by strengthening protections for existing marine protected areas or creating new ones. This process will be important in the development of ocean and coastal policy and consideration of the NPS role in marine conservation.

Big Lagoon State Park Management Plan

Big Lagoon State Park, a unit of Florida's state park system, is just northwest and across the Intracoastal Waterway from the Perdido Key Area of the national seashore. Opened in 1978, this complementary coastal park includes 698 acres, where nature trails, picnic facilities, campsites, an observation tower, an amphitheater, and a swim beach are provided. A boat ramp with dock provides easy access to the lagoon and the Intracoastal Waterway.

In 2006 the Florida Department of Environmental Protection, Division of Recreation and Parks, prepared a *Unit Management Plan* for Big Lagoon State Park. The plan serves as the basic statement of policy and direction for management of the park. The plan consists of two interrelated components for resource management and recreation.

ALTERNATIVES, INCLUDING THE PREFERRED ALTERNATIVE

GULF ISLANDS NATIONAL SEASHORE

CHAPTER TWO

INTRODUCTION

This chapter presents four alternatives, including the preferred alternative and a no-action alternative, for future management of Gulf Islands National Seashore. The alternatives were developed in concert with an ongoing public involvement process, described in detail in the "Public and Agency Involvement" section in chapter 5. The no-action alternative is included as a baseline for comparing the environmental consequences of implementing each "action" alternative. To truly understand the implications of an alternative, it is important to combine the seashorewide desired conditions and management strategies, servicewide laws and policies described in chapter 1 with the management actions described in an alternative.

This chapter also includes sections on implementation of the general management plan, management zones, user capacity, mitigative measures common to all action alternatives, and the environmentally preferred alternative. A table that compares the attributes of each alternative and another that compares the anticipated environmental consequences of implementing each alternative is provided at the end of the chapter.

The National Park Service solicited input from the public, government agencies, and other organizations regarding the issues and desired conditions for Gulf Islands National Seashore through a series of newsletters and public meetings to develop these four alternatives for guiding future management of the national seashore. These alternatives reflect the range of ideas proposed by the national seashore staff and the public.

MANAGEMENT ZONES

OVERVIEW

Management zones prescribe how different areas of the national seashore would be managed. Each management zone specifies complementary natural resource conditions, cultural resource conditions, opportunities for visitor experiences, and appropriate facilities, and combines these into a possible management strategy that could be applied to locations within the national seashore. As such, management zones give an indication of the management priorities for various areas. Seven management zones have been developed for the national seashore—the diverse visitor opportunity zone; recreational beach zone; natural settings with dispersed recreation zone; seagrass bed protection zone; nonmotorized, primitive visitor opportunity zone; resource management and science priority zone; and national seashore operations zone. A more detailed description of each management zone is presented below.

MANAGEMENT ZONE DESCRIPTIONS

Diverse Visitor Opportunity Zone

The diverse visitor opportunity zone includes areas capable of absorbing a diverse range of outdoor recreation and interpretive visitor opportunities intermixed within both natural and developed environments. Visitors are provided a variety of services including orientation, education, and other structured activities.

Desired Visitor Experience. Visitors are provided with seashore orientation as well as a wide range of recreational, interpretive, and educational opportunities. These activities are supported by a variety of visitor services that complement and enhance these opportunities. High levels of visitor encounters are expected; groups of all sizes are accommodated.

Desired Resource Condition. Natural resources are managed to maintain or restore their natural conditions, although some areas could be modified to accommodate visitor services, interpretation, and recreational activities. Cultural resources are stabilized and preserved, or they could be rehabilitated or adaptively reused to support visitor services and interpretation.

Appropriate Facilities and Functions. Facility development can include adaptively reusing historic structures or constructing modern facilities to accommodate national seashore orientation, interpretive and/or educational programs, sales of seashore-related literature and interpretive products, equipment rental for recreational activities, food, souvenir, and beverage service, and sanitary facilities. Roads, trails, docks, and parking would provide convenient access links between visitor activity areas. Some administrative functions to support NPS operations may be collocated with visitor facilities.

Recreational Beach Zone

The recreational beach zone accommodates traditional recreational beach activities and facilities. Recreational beaches are defined as those beach areas that correlate with a parking lot, boardwalk or trail, and where the public is invited to participate in sunbathing, beach combing, sand sculpture, swimming, and other customary recreational pursuits, and where such activities are frequent and commonplace.

Desired Visitor Experience. Visitors are provided convenient and easy access to recreational beaches for sunbathing, swimming, surfing, strolling, surf fishing, and sand castle play. Levels of visitor encounters are expected to be highest near access areas to and from the beach.

Desired Resource Condition. Natural resources are managed to maintain or restore their natural conditions, although there could be an allowance for minor impacts associated with visitor access, sanitation, and public safety. Cultural resources are stabilized and preserved.

Appropriate Facilities and Functions. Landward of the primary dune, facility development can include access roads, parking, picnic/shade shelters, interpretive waysides, and sanitary facilities concentrated at areas that access the beach. Beach areas off the primary dune would remain mostly undeveloped with the exception of designated beach access trails over the primary dune, signs, and lifeguard stands.

Natural Settings with Dispersed Recreation Zone

The natural settings with dispersed recreation zone includes areas largely undeveloped, in their natural settings, and managed for disperse motorized and/or nonmotorized recreational activities.

Desired Visitor Experience. Visitors have an opportunity to get away from the sights and sounds of the urban environment and explore the natural features of the national seashore. Visitor encounters would range from solitude to informal gatherings depending upon time of day, week, or season.

Desired Resource Condition. Natural resources are managed to maintain or restore their natural conditions, although there could be an allowance for minor impacts associated with visitor access and public safety. Cultural resources are stabilized and preserved.

Appropriate Facilities and Functions. Facility development is mostly limited to resource protection, visitor access, and public safety. Roads, trails, docks, and interpretive waysides can be used to enhance interpretation, sightseeing, and access opportunities.

Seagrass Bed Protection Zone

The seagrass bed protection zone includes areas containing seagrass beds, submerged aquatic vegetation, and/or habitat areas suitable for seagrass establishment. These areas are managed to prevent resource damage to seagrass beds from vessel groundings, anchoring, and propeller scarring. Seagrass bed protection zones would be established using bathymetry (the measurement of the depths of oceans, seas, or other large bodies of water), and may extend out from the shoreline several hundred yards in some locations depending on the extent of the seagrass beds. Some of these areas may be restricted to nonmotorized activities.

Desired Visitor Experience. Visitors have opportunities to traverse through these areas and access shoreline features; however, depending on the degree of impacts observed and recorded through NPS monitoring efforts, restrictions may be placed on visitor use (e.g. shoreline landing restrictions) in these areas as conditions change.

Desired Resource Condition. Seagrass beds and associated submerged aquatic vegetation are healthy and providing nursery habitat for marine species. An ongoing monitoring program, including mapping, would be developed to detect changes in seagrass bed health and extent. Adaptive management options may be needed to respond to changing conditions observed over time for this dynamic resource.

Appropriate Facilities and Functions. For most areas within this zone there would be very minimal facilities provided, although the placement of mooring buoys, navigational aids, signs, or dock structures may be provided depending on the degree of management intervention required to protect the resource.

Nonmotorized, Primitive Visitor Opportunity Zone

The nonmotorized, primitive visitor opportunity zone is undeveloped, primitive, intact wildlands managed to perpetuate their natural settings. These areas include the Gulf Island Wilderness (Horn and Petit Bois Islands) as well as other areas of the national seashore that would be managed in a similar way.

Desired Visitor Experience. Visitors have an opportunity to experience a sense of discovery and adventure in nonmotorized, primitive setting. Natural sounds, tranquility, and remoteness predominate. Visitors would need to be self-reliant and prepared for personal challenge. There would only be occasional encounters with others outside of one's group beyond the entry of the zone.

Desired Resource Condition. Natural resources are managed to maintain or restore their natural conditions. Cultural resources are stabilized and preserved.

Appropriate Facilities and Functions. There is no facility development in this zone outside of limited primitive trail stabilization and signs for vital safety messages.

Resources Management and Science Priority Zone

The resources management and science priority zone are areas of high resource sensitivity and intrinsic value and are managed for the highest level of protection. Visitor use is restricted, unless permitted for research and/or educational purposes.

Desired Visitor Experience. Visitor use is restricted, unless permitted for research and/or educational purposes.

Desired Resource Condition. Resources are managed for the highest level of preservation and protection for exceptional and critical ecosystems, habitats, and processes. Cultural resources are stabilized and preserved.

Appropriate Facilities and Functions. There is no facility development in this zone unless determined essential for resource protection, research, and/or monitoring purposes.

National Seashore Operations Zone

The national seashore operations zone includes areas of low resource sensitivity reserved for administrative and maintenance support of national seashore operations.

Desired Visitor Experience. Visitor use is discouraged in these areas; however, visitors engaged in service projects or other official business may be involved in activities in this zone.

Desired Resource Condition. Natural resources are managed to maintain or restore their natural conditions, or they could be modified to accommodate NPS operations. Cultural resources are stabilized and preserved, or they can be rehabilitated to accommodate NPS operations.

Appropriate Facilities and Functions. Facility development can include adaptively reusing historic structures or constructing modern facilities to support NPS operations such as administrative and management office space, emergency and resource protection response, employee housing, maintenance, utility treatment, storage, and associated roads and parking.

USER CAPACITY

OVERVIEW

General management plans for national park system units are required by law to identify and address implementation commitments for user capacity, also known as carrying capacity. The National Park Service defines user capacity as the types and levels of visitor use that can be accommodated while sustaining the quality of park resources and visitor experiences consistent with the purposes of the park. Managing user capacity in national parks is inherently complex and depends not only on the number of visitors, but also on where the visitors go, what they do, and the "footprints" they leave behind. In managing for user capacity, the park staff and partners rely on a variety of management tools and strategies rather than relying solely on regulating the number of people in a park area. In addition, the ever-changing nature of visitor use in parks requires a deliberate and adaptive approach to user capacity management.

The foundations for making user capacity decisions in this general management plan are the purpose, significance, special mandates, and management zones associated with the park. The purpose, significance, and special mandates define why the park was established and identify the most important resources, values, and visitor opportunities that would be protected and provided. The management zones in each action alternative describe the desired resource conditions and visitor experiences, including appropriate types of activities and general use levels, for different locations throughout the park. The zones, as applied in the alternatives, are consistent with, and help the park achieve, its specific purpose, significance and special mandates. As part of the National Park Service's commitment to implement user capacity, the park staff would abide by these directives for guiding the types and levels of visitor use that would be accommodated while sustaining the quality of park resources and visitor experiences consistent with the purposes of the park.

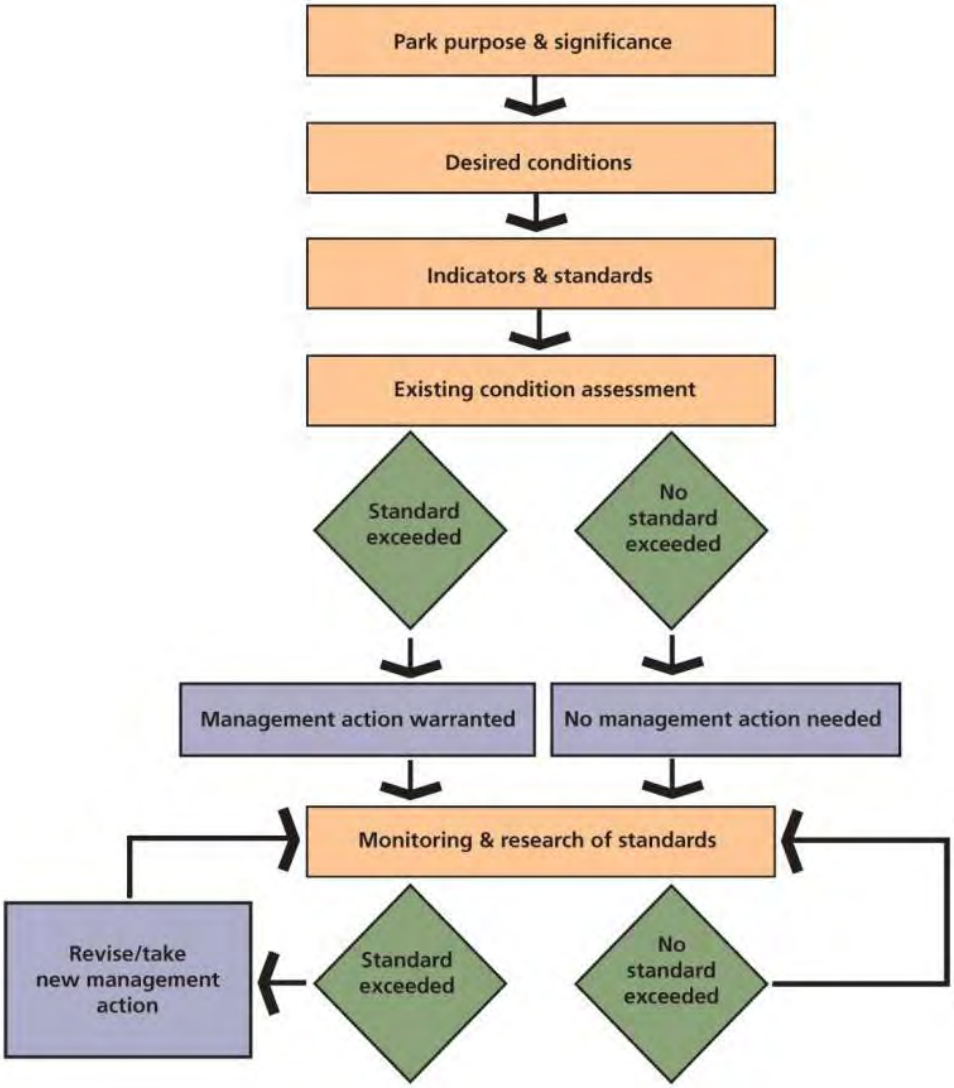
In addition to these important directives, this plan includes indicators and standards for Gulf Islands National Seashore. Indicators and standards are measureable variables that would be monitored to track changes in resource conditions and visitor experiences. The indicators and standards help the National Park Service ensure that desired conditions are being attained, supporting the fulfillment of the seashore's legislative and policy mandates. The general management plan also identifies the types of management actions that would be taken to achieve desired conditions and related legislative and policy mandates.

Table 1 includes the indicators, standards, and potential future management strategies, allocated by management zones, that would be implemented as a result of this planning effort. The planning team considered many potential issues and related indicators that would identify impacts of concern, but those described below were considered the most significant, given the importance and vulnerability of the resource or visitor experience affected by visitor use. The planning team also reviewed the experiences of other parks with similar issues to help identify meaningful indicators. Standards that represent the minimum acceptable condition for each indicator were then assigned, taking into consideration the qualitative descriptions of the desired conditions, data on existing conditions, relevant research studies, staff management experience, and scoping on public preferences.

User capacity decision making is a form of adaptive management (see figure 1) in that it is an iterative process in which management decisions are continuously informed and improved. Indicators are monitored, and adjustments are made as appropriate. As monitoring of conditions continues, managers

may decide to modify or add indicators if better ways are found to measure important changes in resource and social conditions. Information on the NPS monitoring efforts, related visitor use management actions, and any changes to the indicators and standards would be available to the public.

FIGURE 1: USER CAPACITY FRAMEWORK



INDICATORS AND STANDARDS

The priority indicators for Gulf Islands National Seashore are associated with the following issues:

- Disturbances to shorebirds at posted closures during nesting season
- Shorebird related mortalities on roadways
- Illegal parking on roadways
- Wait time to enter the seashore during peak season
- Amount of vehicles using
- VFW Road at Davis Bayou
- Increase in the total area of propeller scars
- Boats on Petit Bois and Horn Island on weekends during peak season
- Park cleanliness
- Incidents of vandalism
- Contacts/observations related to pet violations during shorebird nesting season

Seabird Closures

Gulf Islands National Seashore has several areas that may be subject to closure because of the potential to have a negative impact on the nesting behavior of federally and state listed shore birds. Certain areas of the park may be closed during nesting season (March through August) to visitation depending on where the birds choose to nest and raise their young. This is done to prevent visitors from intentionally or accidently stepping on eggs or flushing birds from their nests. Areas of special concern are portions of the Fort Pickens, Santa Rosa and Perdido Key in the Florida district and the wilderness islands in the Mississippi District where visitor use occurs near wildlife nesting and roosting locations. The seashore staff already monitor the amount of nesting disturbances related to shorebirds, and the standard will be set at no more than five total disturbances to shorebirds per week during nesting season for the Florida District and no more that five visitor related disturbances per colony, per week in the Mississippi District . This standard will help minimize disturbances and protect the sensitive bird species at the seashore. This standard will also help to curb visitors from entering the closure areas through the monitoring of disturbances at posted closures. Management strategies to enforce this indicator include education on low impact practices, the installment of barriers, more intensive monitoring and patrols of the sensitive areas, restricting access to targeted areas, as well as relocating visitor activities to less sensitive areas.

Shorebird Mortality

A large percentage of visitors to the seashore will traverse the roadway to access the Santa Rosa and Fort Pickens area in the Florida District . Santa Rosa Island is very narrow in certain areas and shorebirds have a tendency to develop colonies on the sides of the road (or very near the road). The park has a posted speed limit on the roadways, but speeding is often a concern. Coupled with the shorebirds nesting sites, speeding can lead to mortalities that could be avoided with lower speeds and more awareness of the birds. The vehicle traffic along the road is not the only concern regarding the reduction of shorebird mortalities. Pedestrians and bikes along the roadway flush birds from their nesting areas and this often results in the birds flying into the road where they are hit by oncoming traffic. Park staff are already monitoring the number of shorebird mortalities along the Fort Pickens and Santa Rosa roadways and thus the standard of no more than 10 shorebird mortalities on these roadways every two weeks during nesting season (March through August) can be reliably tracked. This standard was chosen to reduce the impacts that speeding vehicles, pedestrians, and bicyclist have on shorebird mortalities. If the standard for this indicator is trending upward, seashore management can develop an educational program addressing the impacts of speeding on the roadway. The

education program can also provide information on the impacts that pedestrians and bikes have along the roadways. Increased signage along the roadways, increased monitoring of speeding, and increased penalties during nesting season can also be implemented to reduce shore bird mortalities along the road ways. Although vehicle traffic is not likely to be banned along any of the roadways, temporary closures could apply to pedestrians and bicyclists in sensitive areas.

Illegal Parking

Illegal parking in nondesignated areas can cause a variety of resource concerns including vegetation loss and erosion directly associated with parked vehicles. In addition, parking in nondesignated areas encourages visitors to access the beach and other use areas outside the designated dune walkovers and trails—causing additional vegetation loss, disturbance to wildlife, and possible impacts on submerged cultural resources. Informal parking as a result of too much auto use in the seashore can also cause a variety of visitor experience issues, including additional crowding at already high-use beach areas, visitor safety concerns along the seashore's narrow roadways, and visual impacts from parked cars blocking the views. The indicator and standard for illegal parking was based on the seashore's existing management policy in the Florida District, which has proven to effectively minimize informal parking in the seashore. The standard of no more than eight citations for illegal parking per month will help strengthen the existing policy. Some of the management activities the seashore can employ in relation to this issue include visitor education to encourage voluntary redistribution of use to less used areas of the seashore or during off-peak times, signs on seashore regulations, active redistribution of use to areas with available parking, and closure of districts when the parking spaces are full. If the standard has been violated on several occasions and other management strategies have not been successful, the seashore may consider alternate forms of transportation to access popular sites (e.g. shuttle system).

Wait Time

Maintaining high levels of visitor satisfaction with park experiences is an important management goal. Because of the high levels of use that occur at the seashore during peak use times, visitors often have to drive around looking for a parking spot, are unable to park near the main attractions, or are unable to get into the popular sites at the seashore. This primarily happens at the gate to Fort Pickens, Opal Beach, and Perdido Key in the Florida District. Those that cannot get into the these areas often have to wait until a parking space opens, park outside of the designated parking areas, or leave the park. The seashore staff have established that current wait times to enter the park at peak times are generally considered unacceptable and may be detracting from visitors' experiences and related satisfaction with their visit. Also, parking outside of the designated sites and walking along the road poses a safety hazard to those driving and those walking on the road. To track this issue over the long term, an indicator for wait times to enter the park would be monitored. A standard of no more than a 15 minute wait to enter the park at Fort Pickens, Opal Beach, or Perdido Key during peak use times is proposed. Visitors are willing to tolerate longer wait times, but it has been shown that whenever possible, the wait time should be around 15 minutes or less (Nelson/Nygaard Consulting 2008). The seashore staff do not have long term data for wait times to enter the park and further evaluation of this standard with additional research may be needed. If management action is deemed necessary, education about peak use times, real time information about current use, additional enforcement, and potentially a shuttle system would help park staff maintain desired conditions during peak use times.

Vehicles on VFW Road

The Davis Bayou section of the seashore located in the Mississippi District does not have the level of use that many parts of the Florida District has. However, VFW Road goes through this portion of the seashore and is a major access point for visitors as well a frequently used local commuter road. Recently there was a traffic light positioned at the intersection of U.S. Highway 90 and Park Road to help with the traffic problems related to this road near the seashore entrance. VFW Road is also used by bicycles and pedestrians, which can lead to potential conflicts between these users and vehicle traffic. Visitors have stated that the congested nature of this road takes away from their experience at the park. An existing baseline for the amount of traffic on VFW Road was established in 2010 and the standard was set. Based on this information, at no more than a 25% increase in traffic will be allowed before management actions are needed. If the standard is exceeded on a regular basis, seashore managers can enact an education program on the effects of traffic on the visitor experience; increase law enforcement presence; implement more intense site management (e.g. changes in traffic calming strategies); and if the previous management actions are ineffective, seashore managers may chose to permanently close the road to vehicle traffic.

Impacts to Seagrass

Impacts on seagrass from visitor activities include scarring from propellers, vessel groundings, and anchoring. These impacts can be widespread with dense scarring found in more shallow depths and near areas that are heavily used by boats (NPS 2008b). Increased boating activity, often by boaters with no or only limited previous experience, make parts of the seashore susceptible to further seagrass scarring. The loss of seagrass from boating activities is a significant concern because seagrass beds along the seashore are highly productive and provide vast areas of habitat for recreationally and commercially important fish and invertebrates. Although active restoration of damaged seagrass communities is technically possible, it is expensive and time consuming. Also, recent model estimates for seagrass recovery rates suggest that it may take decades for some areas to fully recover (NPS 2008b).

The Natural Resource Damage Assessment, the restoration focused process of assessing the damage of the gulf oil spill, conducted an aerial survey in 2010 that documented the severity and extent of seagrass scarring around the seashore. The study identified a baseline for seagrass scarring that will be the foundation for the seashores monitoring efforts in the future. Minimizing the extent and severity of impact on the seagrass beds has been the focus of ongoing management strategies, including educating visitors on low-impact boating practices. The indicator for seagrass scarring would encourage the use of adaptive management strategies to help reduce impacts at the seashore. The goal of these efforts would be to prevent at some increase in area of seagrass scarring per year over baseline conditions Establish a standard will help prevent the immediate and long term proliferation of seagrass scarring. Some of the management strategies being considered in this plan to further manage this impact include implementing seagrass bed protection zones, improved posting of the regulations, an increase in the idle/slow speed zones, access limitation, and/or area closures.

Boat Densities on the Wilderness Islands

The Mississippi District of the seashore manages Petit Bois and Horn islands, both of which are federally designated wilderness areas. These islands have been recognized as being among the last of the untouched and undeveloped barrier islands on the Atlantic and Gulf coasts. They are remote and isolated: both are located 10-12 miles off the mainland. However, the islands become a

popular destination for recreational boaters on weekends, especially during the summer months. Park staff have stated that on busy weekends during the summer, Horn and Petit Bois islands can have upwards of 650 boats at a time in the high use corridors. These high use corridors tend to be on the north side and concentrated around the tips of the islands. Although past research has been done to determine the appropriate amount of boats per acre in different types of settings (Aukerman and Haas 2004), the wilderness islands at the seashore pose some unique issues.

The remote locations of the islands make them difficult to manage and current lack of limitations on use has led to a situation that is incompatible with wilderness values. Issues of crowding, user conflicts, noise, the protection of wilderness values (e.g. solitude), and the ability for seashore staff to respond to an emergency are all concerns at both wilderness islands. For these reason a standard of no more than 250 boats per day on Horn Island and no more than 75 boats per day on Petit Bois Island in the high use corridors was developed. If through the monitoring process either of these standards are exceeded then the park will increase visitor education about the unique values of the wilderness islands, increase ranger patrols on the islands, and possibly implement a permit system. If the standards on the island are habitually violated, then the park may consider temporary or permanent closures of the problem areas.

Cleanliness Complaints

Visitors to the seashore expect to see a park that is well maintained, clean, and free of litter. The cleanliness of the seashore is tied to overall visitor satisfaction and the park works daily to maintain this level of satisfaction. NPS staff track and evaluate visitor comments that may indicate problems associated with violations of regulations related to cleanliness (e.g. littering). These problems may affect visitors' ability to have high quality recreation opportunities and could, on occasion, affect visitor health and safety. A standard of no more than eight complaints a year related to park cleanliness was establish to maintain the visitors level of satisfaction. If complaints exceed the established standard, or trends indicate a problem area, appropriate management actions would be taken to mitigate the problem. Such management actions may be an increased monitoring of complaints, posting of the seashore regulations, increasing staffing at visitor facilities, and the addition of visitor facilities (e.g. garbage cans).

Vandalism

Visitor use impacts on archeological and cultural sites include wear on historic structures and unintentional disturbances to archeological resources and historic structures. Cultural resources are nonrenewable, so impacts, especially those resulting from disrespectful behavior, must be minimized to the extent possible. Natural resources are also vulnerable to acts of vandalism such as graffiti on rocks or trees. The seashore staff are already using internal guidelines to monitor impacts of vandalism to these resources. Management efforts would be focused on maintaining the integrity and condition of all sites and resources, so the standard has been set at no more than five incidences of vandalism per a three month time period per district (i.e., Florida and Mississippi). To ensure that this standard is maintained, visitor education and enforcement of park regulations would be continued, and fencing off and potentially closing particularly vulnerable areas would be considered.

Pet Violations

Pets are a welcome guest to the seashore, but with restrictions. Pets, specifically dogs, must be on a leash at all times and are allowed on park trails, multi-use paths, and park roads. Pets are not allowed on the beaches in the Florida District or the

wilderness islands in the Mississippi District. These regulations are in place to reduce the potential for visitor conflicts and especially to prevent disturbances to sensitive wildlife species. State and federally protected shore birds are particularly susceptible, and are easily flushed off their nest by pets, which could lead to predation of the eggs or potential abandonment of the nest. The park dutifully enforces the pet regulations and administers citations and warnings when appropriate, but there are occasions when there are signs of dogs in enclosed areas that have been closed for shorebird nesting. The seashore developed an indicator that captures the citations/warnings as well as the observed instances of pets in restricted areas. The seashore staff also have an extensive shorebird monitoring program already in place that will ensure the enforcement of the standards. Although the indicators are the same for the two districts at the seashore, the standards are different. The standard for the Florida District will be no more than five contacts/observations related to pet violating per week during the shorebird nesting season. The standard for the Mississippi District is slightly different to capture the unique nature of the islands. A standard of zero contacts/observations related to pets on Petit Bois and Horn islands per week during shorebird nesting season. This zero tolerance standard reflects the wilderness character of these islands. The standard for the other islands in the Mississippi District (East Ship, West Ship, and Cat Islands) will be no more than five contacts/observations related to pets per week during shorebird nesting season. This standard reflects the more recreational nature of these islands and the potential for more interaction with birds and pets. Regardless of the seashore district, if the standard is violated the seashore can implement the same management actions. Seashore staff can increase the amount of education and interpretation related to pets and their potential impacts, law enforcement staff can increase the penalty for violations during shorebird nesting season, and more rangers can be dispatched to patrol the beaches and islands. If the standards are consistently being violated, pets can be temporarily or permanently restricted from sensitive areas within the seashore.

LONG-TERM MONITORING

The seashore staff would continue monitoring use levels and patterns throughout the seashore. In addition, the seashore staff would monitor these user capacity indicators. The rigor of monitoring the indicators (e.g., frequency of monitoring cycles, amount of geographic area monitored) might vary considerably depending on how close existing conditions are to the standards. If the existing conditions are far from exceeding the standard, the rigor of monitoring might be less than if the existing conditions are close to or trending towards the standard.

Initial monitoring of the indicators would determine if the indicators are accurately measuring the conditions of concern and if the standards truly represent the minimally acceptable condition of the indicator. Seashore staff might decide to modify the indicators or standards and revise the monitoring program if better ways are found to measure changes caused by visitor use. Most of these types of changes should be made within the first several years of initiating monitoring. After this initial testing period, adjustments would be less likely to occur. Finally, if use levels and patterns change appreciably, the seashore staff might need to identify new indicators to ensure that desired conditions are achieved and maintained. This iterative learning and refining process, a form of adaptive management, is a strength of the NPS user capacity management program.

TABLE 1: SUMMARY OF USER CAPACITY INDICATORS, STANDARDS AND POTENTIAL MANAGEMENT STRATEGIES

Note: peak season = March through August

Indicator	District	Standard	Management Strategies
Number of visitor related nesting disturbances to shorebirds at posted closures during nesting season	Florida	There will be no more than 5 total visitor related disturbances to shorebirds in the three management areas per week during nesting season *Management Area = Fort Pickens, Perdido Key, Santa Rosa*	• Increase in visitor education on low impact practices and park regulations (e.g. at the entrance stations) • Increase signage • Increase fencing, barricades, visual barriers, vegetative buffers • Increase in staff patrols • Restrict access to ranger/docent-led programs only • Restrict visitor access to targeted areas • Relocate visitor activities
Number of visitor related nesting disturbances to shorebirds at posted closures during nesting season on the islands	Mississippi	There will be no more than 5 visitor related disturbances to shorebirds at posted closures per colony, per island, per week during nesting season	• Increase in visitor education on low impact practices and park regulations • Increase in staff patrols • Increase signage • Increase fencing, barricades, visual barriers, vegetative buffers • Restrict access to ranger/docent led only • Restrict visitor access to targeted areas • Relocate visitor activities

Indicator	District	Standard	Management Strategies
Amount of documented shorebird related mortality on the roadways	Florida	There will be no more than 10 bird mortalities on the Fort Pickens and Santa Rosa roadways every two weeks during shorebird nesting season	• Increase in visitor education on impacts of speeding on the roadways • Increase signage (e.g. reader boards) • Monitor speeding on the roadways (e.g. radar) • Increase penalties during nesting season • Increase fencing, barricades, visual barriers, vegetative buffers near roadways • Increase in dedicated law enforcement patrols • Develop task force (set teams) to enforce regulations • Temporary road closures for pedestrians and bicycles
Amount of illegal parking on Fort Pickens Rd., J. Earle Bowden Way, and Johnson Beach Rd.	Florida	There will be no more than 8 citations for illegal parking per month	• Increase education about impacts of parking along the sides of the road • Encourage non-peak use • Redirecting visitors to other, less crowded areas • Continue temporary district gate closures when parking lots are full for that district • Evaluate alternative modes of transportation access to the national seashore

Indicator	District	Standard	Management Strategies
Wait time to enter gate at Fort Pickens, Opal Beach, and Perdido Key during peak season	Florida	Visitors will not wait more than 15 minutes to enter at these sites during peak season (this will be during peak times, not during "normal" operations)	• Actively redistribute auto use to areas with available parking • Greater efforts towards public education on regulations and toward encouraging voluntary redistribution of use (includes advanced planning information that encourages visitation to less used areas or at off-peak times) • Provide real-time information on parking availability • Continue temporary district gate closures when parking lots are full for that district • Evaluate alternative modes of transportation access to the national seashore
Amount of vehicles using VFW Road at Davis Bayou	Mississippi	There will be no more vehicles than 25% above existing baseline using VFW Road (baseline of 900)	• Education (e.g., public awareness campaign) • Enforcement (e.g., signs, Increase law enforcement presence, sanctions) • Site management (e.g., change in traffic calming strategies) • Closure of road
% increase in the total area of seagrass scarring based on baseline conditions	Parkwide	There will be no more than X% increase in area of seagrass scarring per year over the baseline condition, with a cap of Y% increase in area	• Greater efforts towards education and awareness of regulations and sensitive resources

Indicator	District	Standard	Management Strategies
		over the baseline condition per decade *The baseline condition will be determined in the near future (likely in 2011) as the results of the NRDA-sponsored aerial reconnaissance and when other data become available*	• Implement seagrass bed protection zones • Increase in staff and greater enforcement of regulations • Better posting of regulations • Better marking of shallows and other improved aids to navigation • Increased idle or slow-speed zones • Mandatory education and/or permits • Access limitations (e.g., regulations for sizes of boats) and/or area closures
Number of boats on Petit Bois and Horn islands on weekends during peak season	Mississippi	There will be no more than 250 boats in the high use corridor per day on Horn Island on weekends during peak season There will be no more than 75 boats in the high use corridor per day on Petit Bois Island on weekends during peak season	• Increase visitor education about impacts to wilderness values, safety concerns and potential resource impacts • Increase ranger patrols • Implement a permit system • Permanent moorings • Temporary or permanent closures
Complaints related to park cleanliness	Parkwide	There will be no more than 8 complaints related to park cleanliness per year	• Increased monitoring of complaints • Better posting of regulations • Additional signage • Additional staffing of visitor facilities • Addition of visitor facilities (e.g., garbage cans)

Indicator	District	Standard	Management Strategies
Number of incidents of vandalism	Parkwide	There will be no more than 5 incidents of vandalism per 3 months in the Mississippi District There will be no more than 5 incidents of vandalism per 3 months in the Florida District	• Increase in visitor education on low impact practices and park regulations • Increase fences or barriers • Increase staff presence • Increase monitoring • Temporarily close area while undergoing conservation treatment • Close problem area, except under supervision
Number of contacts/observations related to pet violations during shorebird nesting season *Citations and warnings are included in the contacts/observations*	Florida	There will be no more than 5 contacts/observations related to pet violations per week during shorebird nesting season	• Increase education and interpretation of impacts related to pets (e.g., press releases and information provided at entrance stations) • Increase efforts to educate visitors about park regulations (i.e., no pets on the beach) • Increased penalty for violation • Additional signage • Increased ranger patrols of the beach • Temporary/permanent closures of areas to pets (in the parking areas adjacent to the beach
Number of contacts/ observations related to pet violations on the islands during shorebird nesting season	Mississippi	There will be 0 contacts/ observations related to pets per week on Petit Bois and Horn islands during shorebird nesting season	• Increase education and interpretation of impacts related to pets (e.g., press releases and info provided at entrance stations)

Indicator	District	Standard	Management Strategies
		There will be no more than 5 contacts/observations related to pets per island, per week on East Ship, West Ship and Cat islands during shorebird nesting season	• Increase efforts to educate visitors about park regulations (i.e., no pets on the beach) • Increased penalty for violation • Additional signage • Increased ranger patrols of the beach • Temporary/permanent closures of areas to pets (in the parking areas adjacent to the beach)

ALTERNATIVES

Regardless of this planning effort, the National Park Service would continue to follow special mandates and servicewide laws and policies as noted in chapter 1. Similarly, seashorewide desired conditions (and potential strategies to achieve those conditions) for topics ranging from ecosystem management to seashore accessibility are presented in chapter 1 and would apply regardless of which GMP alternative is ultimately selected for implementation. As this *General Management Plan / Environmental Impact Statement* was being developed, the National Seashore was proceeding with a number of projects that are planned or already underway; these projects, discussed in chapter 1 in the "Ongoing NPS Projects and Projects Planned for the Near Future" section and in chapter 4 (cumulative impacts), would also occur regardless of this planning effort. The alternatives described on the following pages, each of which is consistent with maintaining the national seashore's purpose, significance, and fundamental resources and values, present different choices for how to manage resources, visitor use, and facilities within the national seashore.

Each alternative is presented first with a general discussion of the overall vision for the future of the National Seashore outlining desired conditions for visitor experience and resource conditions. These guiding concepts are then followed by a more specific description of management actions or activities for each area within the Florida District and then the Mississippi District.

ALTERNATIVE 1 (NO-ACTION ALTERNATIVE)

CONCEPT

Gulf Islands National Seashore would be managed to continue the protection of its northern Gulf Coast resources and to restore visitor services lost during the hurricanes of 2004-2005.

Visitor Experience

The national seashore would continue to provide opportunities for traditional beach activities (sunbathing, swimming, and beachcombing), marine activities (boating, wave running, scuba/skin diving, and fishing), as well as hiking, biking, motor touring, camping, picnicking, backcountry use, exploration of coastal fortifications, and other uses that are compatible with the protection of the national seashore's scenic, natural, and cultural values. These opportunities range from recreating with large groups within developed to semideveloped areas to finding solitude within an undeveloped wilderness island setting.

The interpretive program would continue to foster public awareness and appreciation of the fundamental resources and values of the national seashore through five primary interpretive themes—(1) Preservation and Protection, (2) Recreation and Remembrances, (3) Forts and Firepower, (4) Sea, Sand, Salt Marshes, and Maritime Forest, and (5) Location and Legacy.

Provisions to ensure safe visitor use and enjoyment would continue to include providing lifeguard personnel at designated swim beach areas and law enforcement patrols with search and rescue capabilities. Educational information would continue to be provided on the hazards of recreating in the natural environment and exploring historic structures.

Natural Resource Conditions

Natural resources would continue to be managed to preserve the integrity of the national seashore's fundamental terrestrial, estuarine, and marine ecological resources while ensuring that visitors have access to a range of recreational opportunities within a wide variety of coastal settings. Exceptional and critical natural resources and processes would continue to be managed to preserve their intrinsic values. These areas would continue to be inventoried, evaluated, monitored, protected, and preserved in accordance with the NPS Service policies and legislative and executive requirements. Strategies would continue to be developed to protect resources and conduct data collection where threats have been identified. Restoration efforts would continue to focus on reestablishing natural resource conditions that have been altered or impacted by human activity, however, natural resource manipulations would continue in areas surrounding coastal fortifications to ensure protection from threats to their stability and integrity posed by continuing shoreline changes.

Cultural Resource Conditions

Based on cultural resource condition assessments, stabilization efforts would continue on the historic fortifications, associated structures, archeological sites, and museum collections. As funding permits, the national seashore would continue to inventory areas that have not yet been documented. These resources would be evaluated, monitored, and protected in accordance with NPS historic preservation policies and legislative and executive requirements. Strategies would continue to be developed to stabilize resources or to conduct data collection where threats have been identified.

AREA-SPECIFIC MANAGEMENT ACTIONS—FLORIDA UNITS

Naval Live Oaks Area

Access. Access by land would continue via U.S. Highway 98. The national seashore would continue to coordinate with local and state officials to improve safe highway access to and from U.S. 98 and national seashore developed areas. The existing bicycle/pedestrian trail connection along the south side of U.S. 98 would continue to provide visitors with an alternative means of accessing the Naval Live Oaks Area.

Access by water would continue to be permitted by private boat, with unrestricted options for boat landings along the Pensacola Bay and Santa Rosa Sound shorelines.

Visitor Opportunities. Visitor orientation/interpretation and the Eastern National bookstore would continue to be provided at the Naval Live Oaks Visitor Center.

Facilities for day use recreation, including picnic facilities and restrooms and facilities for organized youth group camping, would continue to be provided.

Interpretive nature trails would continue to be provided to areas of special interest on both the north and south sides of Highway 98, including but not limited to the Old Borrow Pit Trail, the Andrew Jackson Trail, and the Brackenridge Nature Trail.

Resource Management. Natural resource management efforts would continue to emphasize terrestrial vegetation and wildlife management, using prescribed fire to enhance wildlife habitat and reduce hazardous fuels. Monitoring efforts would continue to assess trends in the resident gopher tortoise population. In collaboration with other agencies and as funding allows, periodic mapping and monitoring of seagrass bed conditions would continue.

Cultural resource management efforts continue to be supported by the NPS Southeast Archeological Center who periodically provide monitoring and assessment of archeological resources conditions.

Operations Support. The visitor center/headquarters complex at Naval Live Oaks would continue to be the main administrative office space for national seashore staff. Contemporary structures would continue to accommodate Florida District maintenance support within the north Naval Live Oaks compound, including the pole barn, sign shop, and hazmat storage shed.

Contemporary structure would continue to be used to accommodate Resource Management support, such as the fire cache building.

Municipal utility service would continue to be provided from Gulf Breeze.

Pensacola Naval Air Station Historic Sites

Access. Access by land would continue via the main entrance to the Pensacola Naval Air Station via Florida State Highway 292 and going 1 mile south on Florida State Highway 295. Depending on national security level alerts, public access into Naval Air Station grounds might be restricted.

Visitor Opportunities. The contemporary visitor center and bookstore at Fort Barrancas would continue to provide orientation to and overall interpretation of the historic sites in the Pensacola Naval Air Station. Fort Barrancas, Bateria de San Antonio (Water Battery), and Advanced Redoubt would continue to be available for visitor exploration.

The Trench Trail connecting Fort Barrancas and the Advanced Redoubt and the Woodland Nature Trail would continue to provide visitors an opportunity to explore the grounds by foot. Picnic facilities would continue to be provided near Fort Barrancas and the Advanced Redoubt.

Resource Management. Cultural resource management efforts continue to emphasize ongoing stabilization efforts to preserve Fort

Barrancas, Bateria de San Antonio (Water Battery), and Advanced Redoubt. Because Fort Barrancas is a National Historic Landmark, the highest historical designation a structure can be given, it would be afforded special protection and impacts would be minimized. If management of the Pensacola Lighthouse complex were transferred to the National Park Service, the Park Service would offer technical assistance for assessing the stabilization needs for the complex.

The national seashore would continue to coordinate with the command of the Naval Air Station to maintain the historic viewshed of Fort Pickens, Pensacola Pass, and Fort McRee areas.

Operations Support. Staff office space would continue to be provided in the existing Fort Barrancas Visitor Center.

Perdido Key Area

Access. Access by land would continue from Florida State Highway 292. Johnson Beach Road would continue to provide for road shoulder parking with designated dune crossovers providing multiple access points to the beach along the Gulf of Mexico and the lagoon side. The road would continue to extend 2.4 miles east with a turn-around drop-off area at the terminus. The last 0.5 mile would continue to be closed to parking.

Access by water would continue to be permitted by private boat, with unrestricted options for boat landings along the Gulf and Big Lagoon shorelines (except in designated swim areas).

Access by water would continue to be permitted by private boat, with unrestricted landings along the Gulf of Mexico and Santa Rosa Sound shorelines.

Visitor Opportunities. The recreation area at Johnson Beach would continue to include restrooms, parking, covered picnic facilities, and swim beach with lifeguard, as well as the small boat launch area and parking for canoe, kayak, and other small boat use on the lagoon side just north of the beach.

Interpretive opportunities would continue to be provided throughout the area, including interpreting the history of Rosamond Johnson Beach and maintaining the Discovery Trail on the north side of Perdido Key.

A small boat launch area for canoe, kayak, and other small boats would continue to be provided. No ramp would be provided, and users would continue to carry down their boats because the area is very shallow (2 feet deep); parking for 6-10 cars north of the Johnson Beach area would continue.

The eastern side of Perdido Key would continue to be a popular anchorage, with heavy visitor use around and on the eastern tip.

Primitive camping would continue to be allowed 0.5 mile beyond the end of the road. All walk-in campers would continue to be required to sign in at the ranger station to allow for overnight parking.

Resource Management. Natural resource management efforts would continue to emphasize inventory, monitoring, and trend analysis of nesting shorebirds and sea turtles from mid-March through September. Volunteer efforts would continue to extend the reach of existing staff in accomplishing this effort. The national seashore would continue to collaborate with the U.S. Fish and Wildlife Service in assessing the conditions of the resident Perdido Key beach mouse populations. In collaboration with other agencies and as funding allows, periodic mapping and monitoring of seagrass bed conditions would continue. Spanish Cove and the shoreline areas between Redfish and Langley Point would continue to be closed to motorized vessels to protect sensitive seagrass bed areas. Shoreline changes would continue to be recorded after major storms.

Operations Support. The existing ranger station, entrance station, maintenance shop

and trailer pad for volunteer housing would continue to be maintained.

Fort Pickens Area

Access. Fort Pickens Road would continue to provide vehicular access between Pensacola Beach and the Fort Pickens Area. If feasible, the road would continue to be reconstructed as needed after major storms.

Two small scale beach access areas with parking would continue to be provided along Fort Pickens Road. Bike and pedestrian access would continue to be permitted along the road shoulders with "share the road" signs. Other designated bike trail opportunities would continue along the abandoned roadway between the campground and Fort Pickens.

To enhance visitor access by water, a new passenger ferry pier will be constructed to accommodate commercial water-based transportation service and NPS administrative use. Planning for this pier is currently underway (via the Fort Pickens Ferry Pier Environmental Assessment and public process). If feasible, the pier may provide private boaters a safer opportunity to load and unload passengers.

Water access for administrative purposes would continue to be supported by an NPS dock facility at the Fort Pickens Ranger Station.

Access by water would continue to be permitted by private boat, with unrestricted landings from Pensacola Bay and the Gulf of Mexico (except in designated swim areas).

Visitor Opportunities. Historic structures within Fort Pickens would continue to be reused to support visitor services. This would include the Fort Pickens visitor center and bookstore, Battery Cooper and Worth for interpretive programs; the firehouse for concession food service and adjacent public restrooms; the mining casemate for public restrooms, library, Eastern National office and storage; Building 5 for auditorium, museum, and staff offices, and the Fort Pickens Ranger Station for indoor exhibits in conjunction with camper registration function.

Contemporary structures would continue to be used to support visitor services, such as the entrance station, the jetties restroom (near fishing pier), Battery Worth picnic shelter and restroom, and Little Langdon picnic shelter and restroom.

Beach recreation facilities would continue to be provided at Langdon Beach, including restrooms/ changing rooms and outdoor showers, a lifeguard station, a picnic shelter, and parking.

The contemporary campground would continue to support recreational vehicle (RV) and tent camping on several loops, including individual and group campsites, restrooms, electrical hookups, a Campground Store, and a dump station.

A contemporary amphitheater structure would continue to be provided for interpretive and educational programs.

Fishing and sightseeing opportunities would continue to be provided at the fishing pier.

Interpretive trails, including the Blackbird Marsh Trail, Dune Nature Trail, Fort Pickens Self Guided Trail, and cross-over trail, would continue to be provided.

The National Park Service would continue to support the Florida National Scenic Trail and terminus in the Fort Pickens Area.

Resource Management. Natural resource management efforts would continue to emphasize inventory, monitoring, and trend analysis of nesting shorebirds and sea turtles from mid-March through September. Volunteer efforts would continue to extend the reach of existing staff in accomplishing this effort. In collaboration with other agencies and as funding allows, periodic mapping and monitoring of seagrass bed conditions would continue. Shoreline changes

would continue to be recorded after major storms.

Cultural resource management efforts would continue to emphasize ongoing stabilization efforts to preserve historic structures within Fort Pickens as well as the structures associated with the Fort Pickens Ranger Station.

Operations Support. Historic structures within Fort Pickens would continue to be used to support Florida District operations and staff housing. The use of other historic structures for expanded housing opportunities would be considered.

The Fort Pickens Ranger Station would continue to be used as a ranger station, campground registration office, and district office space. The garage would continue to be used for equipment and boat storage.

The contemporary structures that support the area's water system and carpenter shop function would continue to be maintained.

Utility services (telephone, power and sanitation) would continue to be provided. The on-site wells and water distribution system would continue to be maintained. The two above ground fuel tanks would continue to service vessels and equipment.

Santa Rosa Area

Access. J. Earle Bowden Way, SR 399 would continue to be maintained as a two-way vehicular public access road and evacuation route between Pensacola Beach and Navarre Beach. Parking would continue to only be allowed in designated areas, and parking on road shoulders would continue to be prohibited. Bike and pedestrian access would continue to be allowed along the road shoulders. Three beach access areas along the road with dune crossovers would continue to be provided.

Access by water would continue to be permitted by private boat, with unrestricted landings along the Gulf of Mexico shoreline (except in designated swim areas).

Visitor Opportunities. Beach recreation facilities at Opal Beach would continue to be provided, including restrooms, outdoor showers, portable lifeguard towers, picnic areas, dune crossovers, and parking.

Overnight camping would continue to be a prohibited activity.

The National Park Service would continue to support the routing of the Florida National Scenic Trail through the area.

Wayside exhibits would continue to be maintained, as would on-site, scheduled, interpretive programs.

Resource Management. Natural resource management efforts would continue to emphasize inventory, monitoring, and trend analysis of nesting shorebirds and sea turtles from mid-March through September. Volunteer efforts would continue to extend the reach of existing staff in accomplishing this effort. In collaboration with other agencies and as funding allows, periodic mapping and monitoring of seagrass bed conditions would continue. Shoreline changes would continue to be recorded after major storms.

Operations Support. Operational support structures such as an entrance station, a maintenance/ranger station, lifeguard station, emergency medical services, office space, and storage within the Opal Beach day use area would continue to be maintained.

Utility service would continue to be provided to Opal Beach.

Okaloosa Area

Access. Vehicular access to the Okaloosa Area would continue to be accommodated by U.S. Highway 98. Boat access to the Santa Rosa

Sound would continue to be accommodated by the existing small boat launch ramp and a trailer parking area.

Visitor Opportunities. The beach recreation facilities at Okaloosa Beach, including restrooms, outdoor showers, a picnic area, parking, and possibly shade structures, would continue to be maintained.

Commercial use authorizations for recreational instruction activities that are self contained using mobile trailers, etc. would continue to be allowed. Organized regatta events using nonmotorized vessels through special use permits would continue to be accommodated.

On-site orientation and interpretive wayside exhibits would continue to be provided.

Resource Management. Natural resource management efforts would continue to emphasize inventory, monitoring, and trend analysis of nesting shorebirds. The site, situated on the eastern end of the national seashore, would also continue to serve as a barometer of potential threats from outside disturbances.

Operations Support. The volunteer trailer pad would continue to be maintained, as would site utilities serviced by the adjacent municipality.

AREA-SPECIFIC MANAGEMENT ACTIONS—MISSISSIPPI UNITS

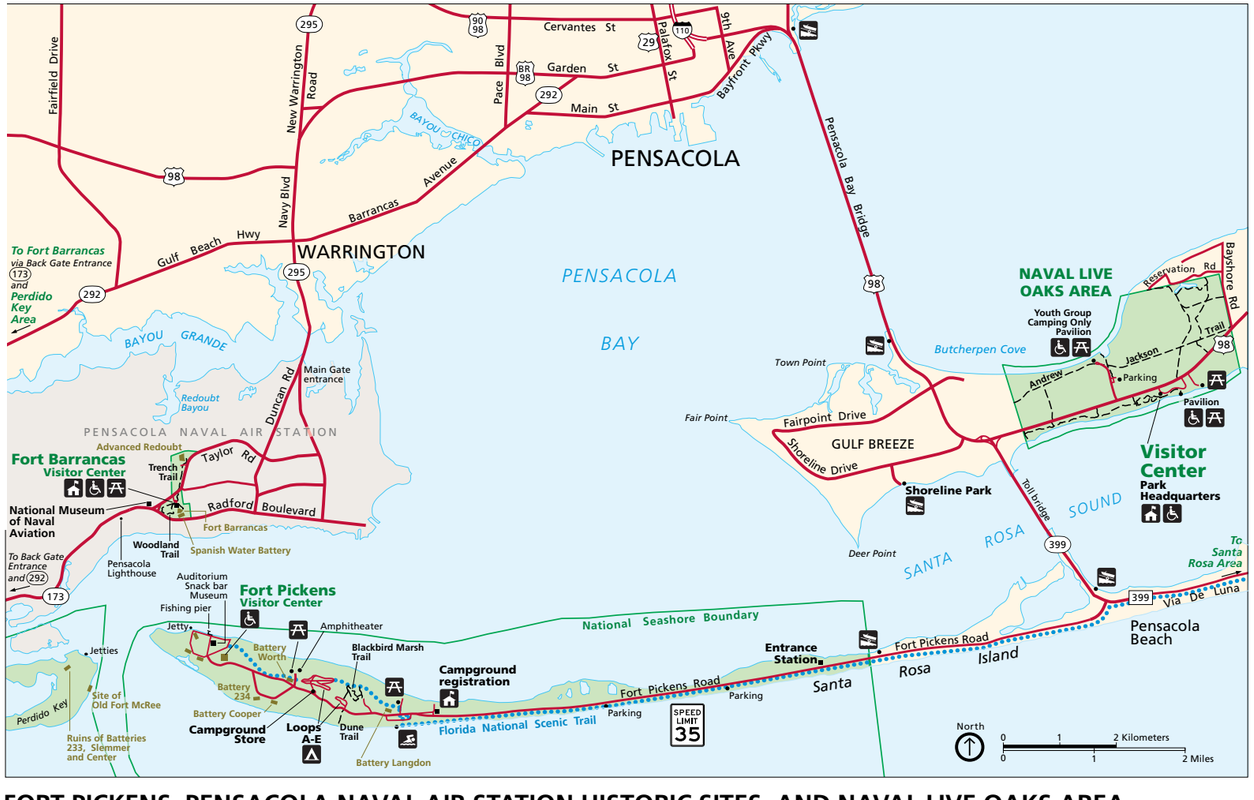
Davis Bayou

Access. The 2.2 mile national seashore entrance road connecting to U.S. Highway 90 would continue to provide access to a number of recreational features within the Davis Bayou Area. Access would continue to be maintained to residential areas from the entrance road. Except for the VFW road, these roads would continue to dead-end in residential areas outside the national seashore requiring their access through the national seashore. Just before Gollott Road, the national seashore has established a road connection with the Gulf Coast Research Lab Cedar Point Facility. In the northwest section of the area, a fifth residential road, Robert McGhee Road, has been gated and closed to auto traffic and would continue to be used as walk-in access and part of the "Live Oak Bicycle Route" connecting Ocean Springs and Davis Bayou. It also would continue to provide for an alternative emergency vehicle access way into and out of the area. Planning for this area would evaluate the possible closure of the VFW road to vehicular traffic to assure the safety of pedestrians and bicyclists.

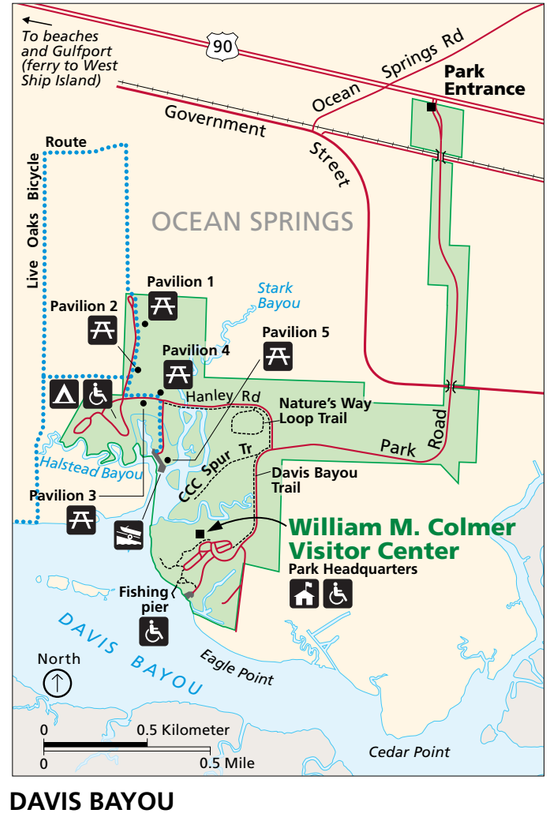
Water access for private boats to and from the Mississippi Sound would continue via the existing boat ramp. Additional water access for paddlers would continue to be accommodated at existing boat launch facility. Other facilities that would continue to be maintained include a public fishing pier at the visitor center and a public boat launch and shelter.

Visitor Opportunities. The William M. Colmer Visitor Center, referred to in this document as the Davis Bayou Visitor Center, would continue to be the national seashore's Mississippi hub for providing visitors with orientation, information, interpretive exhibits, and book sales. Indoor and outdoor interpretive and educational programs would continue to be provided at the visitor center and the campground amphitheater.

Water and land-based opportunities for exploration and learning about the Davis Bayou ecosystem would continue to be provided through guided and self-guided interpretive nature trails and guided boat interpretive tours including the Davis Bayou Trail, South Walk Trail, Arboretum Trail, Nature's Way Trail, and CCC Overlook Trail.



FORT PICKENS, PENSACOLA NAVAL AIR STATION HISTORIC SITES, AND NAVAL LIVE OAKS AREA



DAVIS BAYOU

- Boat launch
- Campground
- Primitive campsite
- Swimming area
- Picnic area
- Wheelchair-accessible
- Ranger station
- Gulf Islands National Seashore
- Multi-use trail
- Fortification
- Trail/boardwalk

ALTERNATIVE 1

Gulf Islands National Seashore

Mississippi • Florida

National Park Service / U.S. Department of the Interior

Back of map

Camping opportunities with access to power and water service hookups would continue to be provided, including campgrounds, group tent camping areas, restrooms, three volunteer RV campsites, and a fee station/office.

Open space for group play would continue to be provided, as would picnic opportunities; existing facilities would continue to be maintained, including picnic shelters and restrooms.

Accessible fishing opportunities would continue to be provided, including the public fishing pier at the visitor center and the fishing pier gazebo. Commercial fishing guide service would continue to be permitted through commercial use authorizations.

Resource Management. Natural resource management efforts would continue to emphasize terrestrial vegetation and wildlife management, using prescribed fire to enhance wildlife habitat and reduce hazardous fuels. Methods would continue to be tested for restoring the wetland prairie ecosystems while maintaining adequate screening of adjacent neighborhoods. In partnership with the Gulf Coast Research Laboratory, the bayou and wetland systems would continue to be monitored, and conditions would be assessed.

Cultural resource management efforts would continue to emphasize ongoing stabilization efforts for the CCC cabins.

Operations Support. The Davis Bayou Visitor Center would continue to provide administrative support space for Mississippi District staff.

The Davis Bayou Area would continue to provide for district maintenance staging for office, shop, and storage space.

Housing for seasonal staff, youth interns, and other partners would continue to be provided at Davis Bayou within the CCC Cabins and at the house and cottages on Boat Launch Road. The existing NPS marina area would continue to support administrative access to Mississippi island areas.

Utility service would continue to be provided from Ocean Springs.

Cat Island

Access. Access to the island would continue by way of private watercraft or limited commercial service. Unrestricted watercraft landings would continue to be allowed on federal lands (NPS jurisdiction extends to the high water mark) from Mississippi Sound and the Gulf of Mexico. The national seashore would continue to coordinate with current landowners to use their private dock to accommodate NPS boat access. The canal system and most of the road network would remain under private ownership and continue to provide private access to areas of the island's interior.

Visitor Opportunities. Visitors would continue to have opportunities to explore the eastern and southern areas of the island that are under federal ownership. Private lands would continue to be restricted from visitor use. Opportunities for primitive overnight camping on federal lands would continue.

No on-site interpretive or educational facilities would be provided. Davis Bayou Visitor Center would continue as the main source of information to and interpretation of Cat Island's history and resources.

Resource Management. Natural resource management efforts would continue to be limited to just basic inventory and monitoring of resource conditions because of the logistics of accessing the island and the limited land area under NPS jurisdiction. The site, situated on the western end of the national seashore, would continue to serve as a barometer of potential threats from outside disturbances.

Shoreline changes would continue to be recorded after major storms.

Cultural resource management efforts would continue to emphasize stabilization of the remnant features of the World War II Cat

Island War Dog Reception and Training Center.

Operations Support. A small storage shed to assist with staging of materials and equipment would be provided on federal lands.

West Ship Island

Access. Access to the island would continue by way of private watercraft or concession operated passenger ferry service from Gulfport and/or Biloxi, Mississippi. Unrestricted landings, except in designated swim beach areas, along the Gulf of Mexico and Mississippi Sound shorelines would continue to be permitted (except in designated swim areas). The NPS docking facility would continue to provide for loading and unloading of passengers and materials for a concession-operated water transportation service and NPS personnel. A lateral pier connected to the existing NPS docking pier would be provided to accommodate safe loading and unloading of private watercraft passengers. Long-term docking of private watercraft would not be permitted.

Visitor Opportunities. A number of visitor facilities, including comfort stations, a concession facility, and picnic/shade shelters, would continue to be provided.

Guided and self-guided interpretive tours would continue within Fort Massachusetts. The North Guard Rooms would continue to provide for a sheltered visitor contact area and accommodate Eastern National operations. The South Guard Room would continue to be used for showing an orientation film and exhibits. Additional outdoor guided interpretive tours and educational programs would continue to be provided in other areas of the island. Interpretive waysides and kiosk would continue to provide self-guided opportunities for interpretation and orientation.
Overnight camping would continue to be prohibited on the island.

Resource Management. Natural resource management efforts would continue to emphasize inventory, monitoring, and trend analysis of nesting shorebirds, sea turtles, and raptors, and establishment of closure areas around active nesting sites. Volunteer assistance in the sea turtle management program would continue to be limited because of the logistics of accessing the island.

In collaboration with other agencies and as funding allows, periodic mapping and monitoring of seagrass bed conditions would continue.

The national seashore would continue to collaborate with the U.S. Army Corps of Engineers to help restore the island's sediment transport and budget system that was disrupted by previous and ongoing dredging of adjacent navigation channels. ("Sediment transport and budget" is a phrase used to describe the amounts and movement of sand along the shore and underwater in the barrier island ecosystem of the national seashore.) Shoreline changes would continue to be recorded after major storms.

Fort Massachusetts would continue to be protected and stabilized, such as beach nourishment (the addition of sand or sediment to an eroding beach or shoreline).

Operations Support. Operations support facilities on the island would continue to be maintained, including ranger residences, a ranger dock, bunkhouse/first aid station, equipment shed, utilities, and communication service.

East Ship Island

Access. Access to the island would continue by way of private watercraft or commercial service. Unrestricted landings along the Gulf of Mexico and Mississippi Sound shorelines would continue to be permitted.
Visitor Opportunities. The island would continue to be managed as primitive area. Visitors would continue to be provided with opportunities to experience a natural barrier

island where solitude and the need to be self-reliant provide inspiration and challenge. The primitive island environment would continue to provide the senses with high quality scenic views, natural sounds, dark night skies, and natural scents. Opportunities for primitive overnight camping along the beach areas would continue.

On-site visitor services and facilities would continue not to be provided. Davis Bayou Visitor Center would continue as the main source of information to and interpretation of East Ship Island's history and resources.

Resource Management. Natural resource management efforts would continue to emphasize inventory, monitoring, and trend analysis of nesting shorebirds, sea turtles, and raptors, and establishment of closure areas around active nesting sites. Volunteer assistance in the sea turtle management program would continue to be limited in this area because of logistics.

In collaboration with other agencies and as funding allows, periodic mapping and monitoring of seagrass bed conditions would continue. Shoreline changes would continue to be recorded after major storms.

The national seashore would continue to collaborate with the U. S. Army Corps of Engineers to help restore the island's sediment transport and budget system that was disrupted by previous and ongoing dredging of adjacent navigation channels.

Plans to provide beach replenishment adjacent to the French Warehouse archeological site are being developed in conjunction with the Mississippi Coastal Improvement Plan.

Operations Support. No on-site operations support facilities would be provided. Staff would need to respond to management issues via West Ship Island, Horn Island, or from Davis Bayou.

Horn and Petit Bois Islands (Designated Wilderness)

Access. Access to the islands would continue by way of private watercraft or commercial service. Unrestricted landings along the Gulf of Mexico and Mississippi Sound shorelines would continue to be permitted. The existing NPS docking facility on Horn Island would continue to be used for administrative purposes.

Visitor Opportunities. Visitors would continue to have opportunities to experience a barrier island wilderness, untrammeled by man, where solitude and the need to be self reliant provide inspiration and challenge. The primitive island environment would continue to provide the senses with high quality scenic views, natural sounds, dark night skies, and natural scents. Visitor services and facilities would continue to be limited, with only the island cross-over trail maintained. Opportunities for primitive overnight camping along the beach areas of the island wilderness would continue.

The Davis Bayou Visitor Center would continue to provide interpretation of Horn and Petit Bois Islands' history and resources, as well as education on wilderness values, appropriate uses, and potential hazards.

Resource Management. Natural resource management efforts would continue to emphasize inventory, monitoring, and trend analysis of nesting shorebirds, sea turtles, and raptors, and establishment of closure areas around active nesting sites. Volunteer assistance in the sea turtle management program would continue to be limited in this area because of logistics. In collaboration with other agencies and as funding allows, periodic mapping and monitoring of seagrass bed conditions would continue. Shoreline changes would continue to be recorded after major storms.

The national seashore would continue to collaborate with the U. S. Army Corps of Engineers to help restore the island's

sediment transport and budget system that was disrupted by previous and ongoing dredging of adjacent navigation channels. The national seashore staff would continue to coordinate with the U.S. Department of Agriculture to eradicate the exotic cactus moth from the island.

Within the administrative enclave area on Horn Island, the use of the tractor trail between the dock and administrative area would be discontinued.

Operations Support. No on-site operations support facilities would be provided on Petit Bois Island. Staff would need to respond to management issues via West Ship Island, Horn Island, or from Davis Bayou.

On Horn Island, a small operations support center would be maintained in the administrative enclave area including ranger residences, bunk, and office complex, and a dock.

STAFFING AND COSTS

The staffing level under alternative 1 would continue to be the equivalent of 86 full-time staff members. The current authorized level of staffing for the national seashore is 111 full-time equivalent employees. Volunteers and partnerships would continue to be key contributors to NPS operations.

The cost estimates provided here are given for comparison to other alternatives only; they are not to be used for budgeting purposes. Although the numbers appear to be absolutes, they represent a midpoint in a possible range of costs. There are no one-time facilities or nonfacility costs associated with this alternative. Annual operating costs under this alternative would be similar to the FY2010 annual operating budget of $7,324,000. Presentation of these costs in this plan does not guarantee future NPS funding. Project funding would not come all at once; it would likely take many years to secure and may be provided by partners, donations or other nonfederal sources. Although the national seashore hopes to secure this funding and would prepare itself accordingly, the national seashore may not receive enough funding to achieve all desired conditions within the timeframe of the *General Management Plan* (the next 20 or more years).

ALTERNATIVE 2

CONCEPT

Gulf Islands National Seashore would be managed to adapt to the wild and dynamic processes of the northern Gulf Coast while providing seashore recreational and educational opportunities. The level of infrastructure to support visitor services on barrier island areas is adapted or removed as the environment changes over time.

Visitor Experience

Similar to alternative 1, the national seashore would continue to include opportunities for beach activities, boating, fishing, camping, picnicking, biking, motor touring, backcountry use, exploration of coastal fortifications, and other uses compatible with the protection of the national seashore's scenic, natural, and cultural values. These opportunities would range from recreating with large groups within developed to semi-developed areas to finding solitude within an undeveloped wilderness island setting.

What is different under this alternative is that when storms or other natural processes significantly impact barrier island infrastructure, contemporary accommodations would not be rebuilt. Interpretive/educational programs, visitor services, and recreational activities would adapt to these changed conditions. Visitors would be provided with more dispersed and primitive recreational opportunities. Seashore recreational opportunities on mainland areas would continue to be provided within a full range of developed to undeveloped settings.

Similar to alternative 1, the interpretive program would continue to foster public awareness and appreciation of the fundamental resources and values of the national seashore. However, accommodations for interpretive/educational programs on barrier islands would adapt to a more undeveloped setting and rely more on nonpersonal services. Conversely, national seashore interpretive and educational opportunities on mainland areas would be expanded to compensate for changes on the barrier islands.

Provisions to ensure safe visitor use and enjoyment would include providing lifeguard personnel at designated swim beach areas and law enforcement patrols with search and rescue capabilities. Educational information would also be provided on the hazards of recreating in the natural environment and exploring historic structures.

Natural Resource Conditions

Similar to alternative 1, natural resources would be managed to preserve the integrity of the national seashore's fundamental terrestrial, estuarine, and marine ecological resources. As the barrier island environment continues to evolve as part of its dynamic coastal processes, management would adapt the level of visitor services, infrastructure, and modes of access in these areas. Exceptional and critical natural resources and processes would continue to be managed to preserve their intrinsic values. Natural resources would continue to be inventoried, evaluated, monitored, protected, and preserved in accordance with the NPS policies, legislative, and executive requirements. Strategies would continue to be developed to protect resources and conduct data collection where threats have been identified. Restoration efforts would focus on reestablishing natural resource conditions that have been altered or impacted by human activity; however, natural resource manipulations would continue in areas surrounding coastal fortifications to ensure protection from threats to their stability and integrity posed by continuing shoreline changes.

The key component for achieving the desired natural resource conditions under this alternative would include establishing a marine management program to inventory and monitor the overall marine environment, including submerged cultural resources. To support this initiative, collaboration, coordination, and cooperation between a consortium of academia, visiting scientists, conservation organizations, and other agencies would be encouraged and actively pursued. This would also include hosting symposiums to promote coastal resource management, stewardship, and understanding of the northern Gulf Coast ecosystem. Enhanced scientific study and research would accelerate the awareness of the national seashore's ecological health and vitality, anticipate/adapt to the effects of climate change, promote restoration of disturbed sites, and improve communication with the public about the dynamic natural processes of the area. Restoration would use emerging information related to natural resources and natural processes and would help eliminate identified adverse effects to these resources.

Cultural Resource Conditions

Under this alternative, a cultural resource management program would be established to compliment the marine management program discussed above. Submerged cultural resources would be identified, documented, and preservation strategies would be developed. All accessioned museum objects pertinent to the national seashore, except for archeological artifacts stored at the NPS Southeast Archeological Center in Tallahassee, Florida, would be consolidated in one multi-park and jointly administered facility as identified in the 2006 NPS Southeast Region Collections Management Plan. This consolidation of museum objects includes the national seashore's natural history collections as well.

The current condition of the historic masonry forts, artillery batteries, and associated structures would be documented, stabilized, and preserved. Archeological sites would be tested to determine the level of significance, data potential, and condition. Subsequent to a major storm or other natural event, cultural resource conditions would be assessed and recovery efforts would be limited to repair and stabilization, and as possible, data acquisition from the impacted element. The collection of museum objects would be focused on their applicability for future research and evaluation of coastal environments during the entire span of human occupation. Extensive use of these objects in educational/interpretive displays would be encouraged.

Similar to alternative 1 and as funding permits, the national seashore would continue to inventory areas that have not yet been documented. These resources would be evaluated, monitored, and protected in accordance with the NPS historic preservation policies and legislative and executive requirements.

Strategies would continue to be developed to stabilize resources or to conduct data collection where threats have been identified.

AREA-SPECIFIC MANAGEMENT ACTIONS—FLORIDA UNITS

Naval Live Oaks Area

Access. Similar to alternative 1, access by land would continue via U.S. Highway 98. The national seashore would continue to coordinate with local and state officials to improve safe highway access to and from U.S. 98 and national seashore developed areas. The existing bicycle/pedestrian trail connection along the south side of U.S. 98 would continue to provide visitors with an alternative means of accessing the Naval Live Oaks Area.

Access by water would continue to be permitted by private boat, however, under this alternative, options for boat landings along the Pensacola Bay and Santa Rosa Sound shorelines might be restricted to designated areas. In addition, to encourage safe public access by water, a dock facility (no ramp) might be provided on the Santa Rosa Sound side in the vicinity of the visitor center.

Visitor Opportunities. Similar to alternative 1, visitor orientation/ interpretation and the Eastern National bookstore would continue to be provided at the existing Naval Live Oaks Visitor Center, and interpretive nature trails would continue to be provided to areas of special interest on both the north and south sides of U.S. Highway 98.

Similar to alternative 1, day use recreation, formalized picnic area with comfort stations, primitive picnic and beach access area (with no restrooms or changing areas), and organized youth group camping would continue to be provided. However, under this alternative the use of the youth group camping area would accommodate any organized group.

Resource Management. Natural resource management efforts would continue to emphasize terrestrial vegetation and wildlife management, using prescribed fire to enhance wildlife habitat and reduce hazardous fuels. Monitoring efforts would continue to assess trends in the resident gopher tortoise population. To minimize damage on seagrass beds from vessel groundings, anchoring, and propeller scarring, a seagrass bed protection zone would be designated along the north and south shoreline areas, extending into the Santa Rosa Sound and Pensacola Bay.

Parking areas would not be expanded, although the paving would be replaced with permeable surfacing to promote stormwater infiltration into the soil and reduced stormwater runoff.

Cultural resource management efforts would continue to be supported by the NPS Southeast Archeological Center who periodically provide monitoring and assessment of archeological resources conditions.

Operations Support. Similar to alternative 1, the visitor center/headquarters complex at Naval Live Oaks would continue to be the main administrative office space for national seashore staff. However, if a major storm takes out Fort Pickens Road, field staff stationed at Fort Pickens (except maintenance staff) would relocate primarily into Naval Live Oaks headquarters facility. Superintendent's office, division chiefs, and administrative functions would relocate into a leased facility outside of the national seashore or into structures at the Pensacola Naval Air Station that may become surplus property.

Maintenance staff would relocate into a new maintenance complex constructed within the existing fenced area of the north maintenance compound to consolidate Florida District maintenance operations. Dedicated space for resource management support including a fire cache would also be accommodated in the new facility.

The existing utility service would be upgraded as needed to accommodate the new complex, with new utility extensions consolidated within a single corridor.

Pensacola Naval Air Station Historic Sites

Access. Similar to alternative 1, access by land would continue using the main entrance to the Pensacola Naval Air Station via Florida State Highway 292 and going one mile south on Florida State Highway 295. Depending on national security level alerts, public access into Naval Air Station grounds might be restricted.

Visitor Opportunities. Similar to alternative 1, the contemporary visitor center and bookstore would continue to provide orientation to and overall interpretation of the historic sites located within the Pensacola Naval Air Station. Fort Barrancas, Bateria de San Antonio (Water Battery), and Advanced Redoubt would continue to be available for visitor exploration. However, if the transfer of management of the Pensacola Lighthouse complex occurs, provision for exterior interpretation of the complex would be assessed and programmed, and the site would be managed as an unstaffed feature of the national seashore.

The Trench Trail connecting Fort Barrancas and the Advanced Redoubt would continue to provide visitors an opportunity to explore the historic grounds by foot, although use of the Woodland Nature trail would be discontinued and the trace restored to near natural conditions. Picnic facilities would continue to be provided near Fort Barrancas and the Advanced Redoubt.

Resource Management. Cultural resource management efforts would continue to emphasize ongoing stabilization efforts to preserve Fort Barrancas, Bateria de San Antonio (Water Battery), and Advanced Redoubt. Because Fort Barrancas is a National Historic Landmark, the highest historical designation a structure can be given, it would be afforded special protection and impacts would be minimized. If the management of the Pensacola Lighthouse were transferred to the National Park Service, stabilization and rehabilitation efforts would be assessed, programmed, and initiated.

The national seashore would enhance their coordination efforts with Naval Air Station command to maintain the historic viewshed of Fort Pickens, Pensacola Pass, and Fort McRee areas.

Operations Support. Staff office space would continue to be provided in the Fort Barrancas Visitor Center.

Perdido Key Area

Access. Similar to alternative 1, access by land would continue from Florida State Highway 292. Johnson Beach Road would continue to provide for road shoulder parking with designated dune crossovers providing multiple access points to the beach along the Gulf of Mexico and the lagoon side. The road would continue to extend 2.4 miles east with a turnaround drop-off area at the terminus. The last 0.5 mile would continue to be closed to parking. However, if the road sustains over 50% destruction from a storm, the 2 miles of road beyond Johnson Beach would not be rebuilt in order to restore natural conditions. The transportation corridor would transition into a multipurpose trail limited to pedestrian or bicycle use only.

Access by water would continue to be permitted by private boat, with unrestricted landings along the Gulf of Mexico shoreline (except in designated swim areas). Landing locations on the Big Lagoon side would be restricted to designated areas.

Visitor Opportunities. A recreation area would continue to be provided at Johnson Beach, with restrooms, parking, covered picnic facilities, and lifeguarded swim beach, as well as the small boat launch area and parking for canoe, kayak, and other small boat use on the lagoon side just north of the beach.

Interpretive opportunities would continue to be provided throughout the area including interpreting the history of Rosamond Johnson Beach and maintaining the Discovery Trail on the north side of Perdido Key. The Rosamond Johnson Beach was a segregated beach in the mid-1900s, and this history would be interpreted for visitors.

The eastern side of Perdido Key would continue to be a popular anchorage, with heavy visitor use accessing the eastern tip. To minimize environmental impacts on the eastern tip of the key and the cultural features found there, a day-use permit system would be implemented to moderate the volume of boat landings. The overnight mooring of boats in this area would be prohibited.

Primitive camping would continue to be allowed 0.5 mile beyond the end of the road, however overnight stays would be restricted to walk-in campers only. Registration at the Johnson Beach ranger station would still be required to allow for overnight parking.

Resource Management. Natural resource management efforts would continue to emphasize inventory, monitoring, and trend analysis of nesting shorebirds and sea turtles from mid-March through September. Volun

teer efforts would continue to extend the reach of existing staff in accomplishing this effort. The national seashore staff would continue to collaborate with the U.S. Fish and Wildlife Service in assessing the conditions of the resident Perdido Key beach mouse populations.

To minimize impacts on seagrass beds from vessel grounding, anchoring, and propeller scarring, a 300-yard nonmotorized zone along the entire north shoreline would be designated. Within this zone, travel corridors, targeted landing locations, and mooring buoys would be established to still allow for motor boat access. These locations might change over time as seagrass bed conditions change.

Cultural resource management efforts would continue to emphasize ongoing stabilization efforts to preserve the remnant batteries and seawall of Fort McRee.

Operations Support. The ranger station, entrance station, maintenance shop, and trailer pad for volunteer housing would continue to be maintained.

Fort Pickens Area

Access. Fort Pickens Road would continue to provide vehicular access between Pensacola Beach and the Fort Pickens Area. If a storm creates the same or greater level of destruction (35% destruction) of the Fort Pickens access road as experience during the 2004 hurricane season, the section of road between the park boundary and the Fort Pickens Ranger Station would not be rebuilt. Asphalt debris and remnant road sections would be removed. Access to Fort Pickens would transition from private vehicle to access by foot, private boat, and possibly commercial ferry service and/or over-sand shuttle service. Administrative vehicular access (primitive) might be established along a designated travel corridor.

The east end of the area would transition into a developed entry point that could accommodate a shuttle staging area with shelters, restrooms, and interpretive plaza near the east boundary at Pensacola Beach.
If Fort Pickens Road was destroyed by a storm, no bicycle path would be rebuilt between the national seashore boundary and the campground. Designated bike trail opportunities would continue to be provided between the campground and Fort Pickens.

Land- and water-based alternative transportation options for accessing seashore features would be implemented as feasible. The national seashore staff would continue to coordinate with Pensacola, Pensacola Beach, and Escambia County to explore other opportunities to integrate national seashore and community based alternative transportation options.

Access by water would continue to be permitted by private boat, with unrestricted landings along the Gulf of Mexico shoreline (except in designated swim areas). Depending on adaptive management measures implemented by national seashore staff to protect seagrass beds, landing locations on the Pensacola Bay side might be restricted to designated areas.

To enhance visitor access by water, a new passenger ferry pier will be constructed to accommodate commercial water-based transportation service and NPS administrative use. Planning for this pier is currently underway (via the Fort Pickens Ferry Pier Environmental Assessment and public process). If feasible, the pier may provide private boaters a safer opportunity to load and unload passengers.

Visitor Opportunities. Historic structures in Fort Pickens would continue to be used to support visitor services. This would include the Fort Pickens visitor center and bookstore; Battery Cooper and Worth for interpretive programs; the firehouse for concession food service and adjacent public restrooms; the mining casemate for public restrooms, library, Eastern National office and storage; Building 5 for auditorium, museum, and staff offices, and the Fort Pickens Ranger Station for indoor exhibits in conjunction with camper

registration function. A historic structure, near the new dock facility, would be adapted for a visitor orientation and contact station. The campground registration function would be collocated in this structure.

Contemporary structures would be maintained to support visitor services, such as entrance station, the jetties restrooms (near fishing pier), Battery Worth picnic shelter and restroom, and Little Langdon picnic shelter and restroom.

The swim beach recreation area at Langdon Beach, with lifeguard services, picnic shelter, restroom/changing rooms, and outdoor showers, would continue to be provided. If the Fort Pickens access road was removed at some point in the future, a new entry point (and possibly a shuttle staging area) would be provided within 0.25 mile beyond the east boundary.

Concession services would be expanded to include recreational equipment rental (bikes, approved alternative power driving mobility devices, electric carts, etc.) to enhance access in the national historic district. The feasibility of providing a seasonal over-sand shuttle service throughout the area would be evaluated.

Fee collection for visitors accessing Fort Pickens by water would be collected at a visitor contact center established within close proximity of dock facility within a historic structure or included in the transportation charge for the passenger ferry service.

Contemporary campground with individual and group sites, restrooms, dump station, and electrical hookups would continue to be maintained. A "tent camping only" zone would be designated in Loop A to separate RV camping from tent camping. If the access road was destroyed by a storm, the campground would no longer provide for RV camping and transition into tent camping only. Electrical hookups and dump station would be removed. Campground registration would move to visitor contact center, and Campground Store function would move to concession store at firehouse. The Campground Store would be removed and the site would be restored to near natural conditions.

Contemporary amphitheater structure would continue to be provided for interpretive and educational programs.

Fishing and sightseeing opportunities would continue to be provided at the fishing pier.

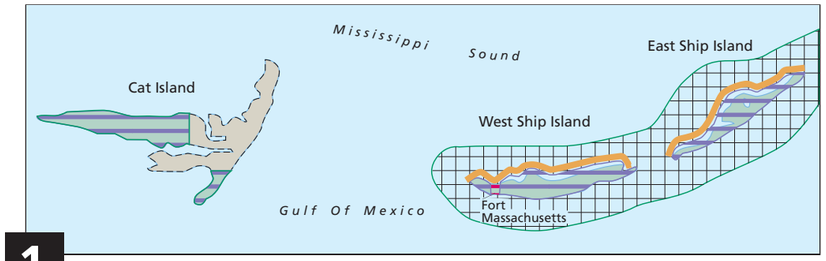
Interpretive trails would continue to be provided, including the Blackbird Marsh Trail, Dune Nature Trail, Fort Pickens Self Guided Tour Trail, and cross-over trail. Additional boardwalk beach crossovers would continue to be provided as needed to minimize resource damage, such as near Battery 234 (lookout tower) and batteries Cooper and Payne. The National Park Service would continue to support the Florida National Scenic Trail and terminus in the Fort Pickens Area.

Resource Management. Natural resource management efforts would continue to emphasize inventory, monitoring, and trend analysis of nesting shorebirds and sea turtles from mid-March through September. Volunteer efforts would continue to extend the reach of existing staff in accomplishing this effort.

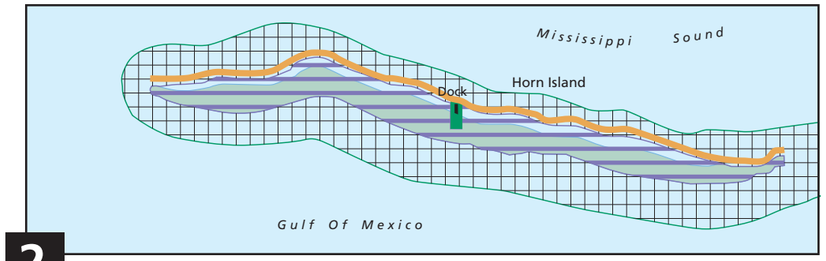
To minimize damage to seagrass beds from vessel groundings, anchoring, and propeller scarring, a seagrass bed protection zone would be designated along the north shoreline area between Battery Worth and Pensacola Beach.

Cultural resource management efforts would continue to emphasize ongoing stabilization efforts to preserve historic structures within the Fort Pickens historic district as well as the structures associated with the Fort Pickens Ranger Station.

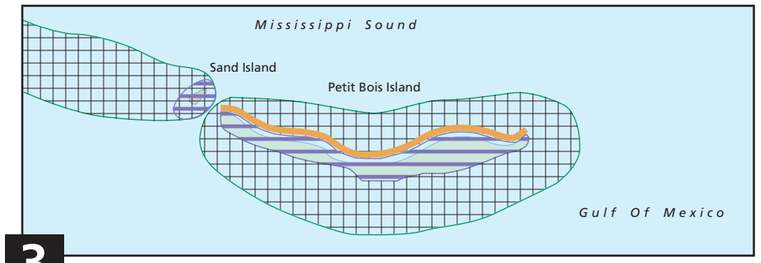
Operations Support. Historic structures within Fort Pickens historic district would continue to be used to support Florida District operations and NPS housing. If a storm destroyed the Fort Pickens access road, the primary district office space for Science



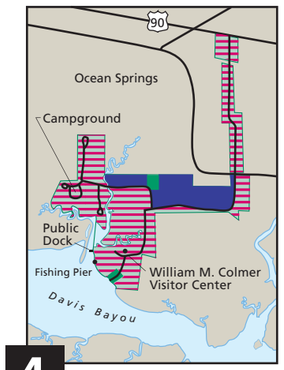
1 Cat Island, West Ship Island, East Ship Island



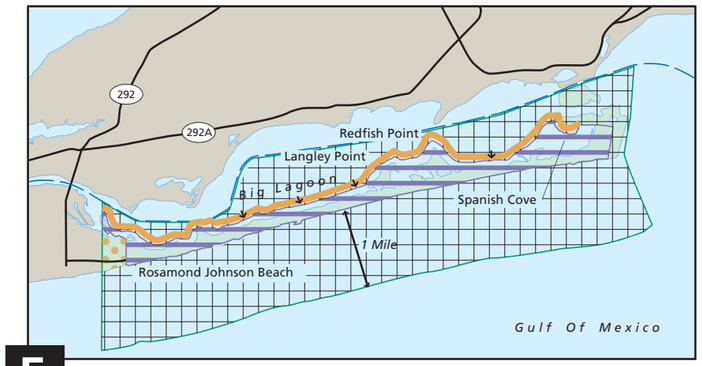
2 Horn Island



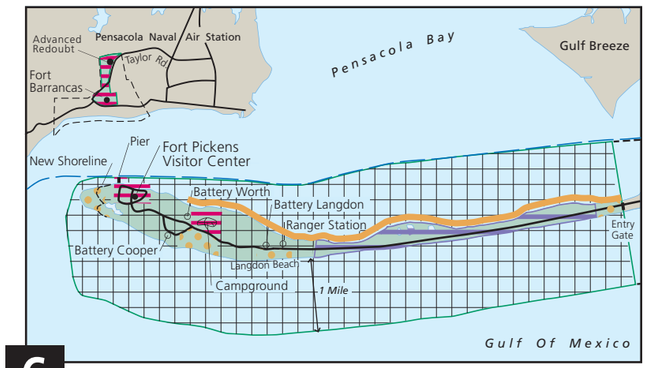
3 Petit Bois Island



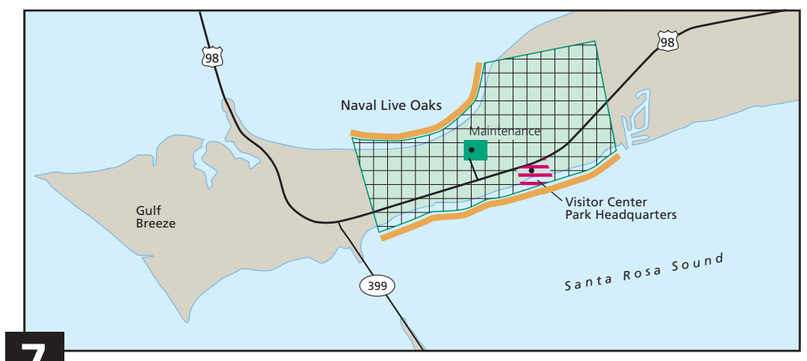
4 Davis Bayou



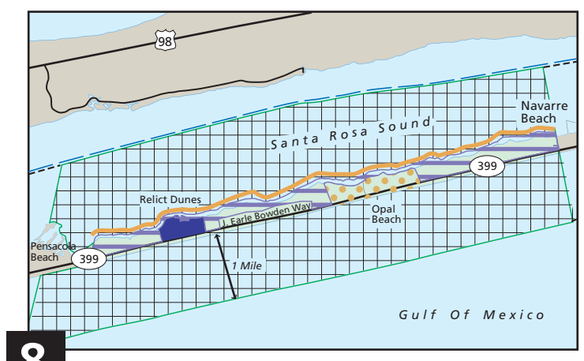
5 Perdido Key



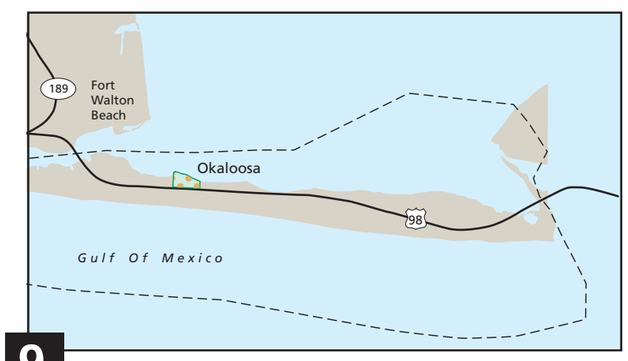
6 Fort Pickens / Fort Barrancas



7 Naval Live Oaks



8 Santa Rosa Area



9 Okaloosa

Intracoastal Waterway

Administrative Boundary

Legislative Boundary

Non NPS Lands

NPS Lands

ZONES

Natural Settings With Dispersed Recreation

Diverse Visitor Opportunities

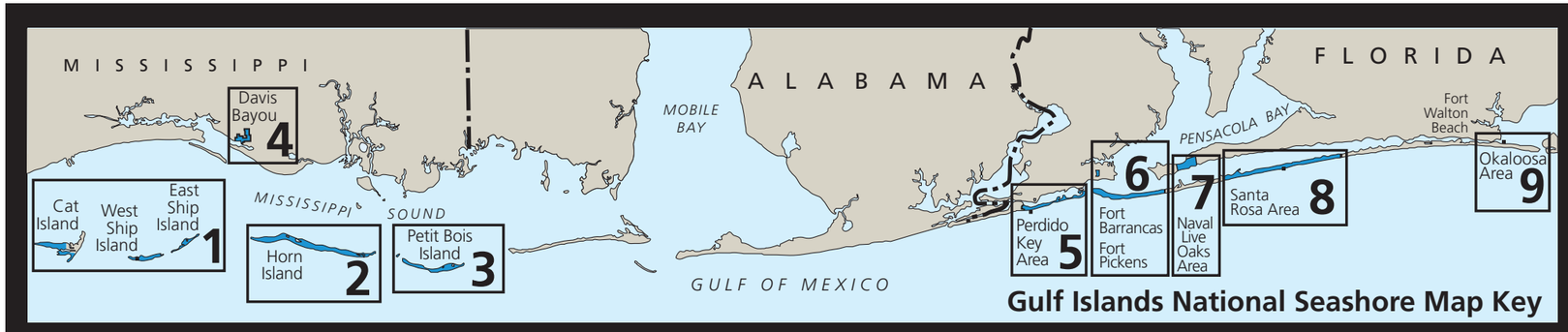
Recreational Beaches

Resources Management and Science Priority

Non-motorized Primitive Visitor Opportunities

National Seashore Operations

Seagrass Bed Protection



Gulf Islands National Seashore Map Key

North

Not to scale

ALTERNATIVE 2

Gulf Islands National Seashore

Mississippi • Florida

National Park Service / U.S. Department of the Interior

BACK OF MAP

and Resources Management and Interpretation divisions would be relocated to the Naval Live Oaks Area. Temporary work space/staging area for these groups would be established in historic structures. The ranger station function would be relocated from the Fort Pickens Ranger Station into another historic structure closer to the Fort Pickens dock area. The Resource and Visitor Protection district office space would be relocated to other Florida units of the national seashore.

A majority of the Florida District maintenance functions would be moved into a new maintenance complex constructed within the Naval Live Oaks north compound area. A limited maintenance staging presence would be maintained with a couple of historic structures to accommodate limited storage and shop space.

Contemporary structures that include the chlorinator building and well head building would continue to be maintained to support the area's water system. Use of the carpenter shop would be discontinued, and the structure would be removed.

If utility systems were destroyed by a storm, the feasibility to transition to on-site sustainable systems or underwater electric services that do not rely on extended utility services from Pensacola Beach would be evaluated. A study would be needed to identify the options for alternative power generation systems, the demand based on the level of occupancy within the historic district, as well as the associated resource impacts with implementing these systems.

At least one required occupancy housing unit would be maintained in one of the historic structures. The use of other historic structures for staff, transient, and volunteer housing would be considered for use as an independent power supply would allow.

Santa Rosa Area

Access. J. Earle Bowden Way, SR 399 (7 miles) would continue to be maintained as a two-way vehicular public access road and evacuation route between Pensacola Beach and Navarre Beach. Parking would continue to be allowed only in designated areas, and parking on road shoulders would continue to be prohibited. Bike and pedestrian access would continue to be allowed along the road shoulders. Three beach access areas would continue to be provided along the road with dune crossovers.

However, if a storm creates the same or greater level of destruction of the J. Earle Bowden Way (SR 399) as experienced during Hurricane Ivan in 2004 (~35% destruction), the road would be reconstructed to provide for a single lane emergency access with sustainable surfacing material. The road would normally be closed to public vehicular traffic unless there was an emergency condition such as a need to provide for hurricane evacuation in one direction or the other. The road might also be made available for one-way use during permitted special events, or if a shuttle system or trolley service is implemented in the future. At all other times, the public would be permitted to use the route for biking, hiking, and electric personal assistive mobility device such as wheelchairs. Administrative vehicular access would be permitted for maintenance activities, law enforcement, emergency medical services, and/or fire protection response.

Access by water would continue to be permitted by private boat, with unrestricted landings along the Gulf of Mexico shoreline (except in designated swim areas). Landing locations on the Santa Rosa Sound side would be restricted to designated areas.

Visitor Opportunities. The swim beach recreation area at Opal Beach would continue to be provided. However, if structures are destroyed by a storm, they would not be rebuilt. Debris would be removed and the site would be restored to near natural conditions. However, entry point parking areas with rest-

rooms would be permitted on the east and west ends.

Wayside exhibits would continue to be provided, as would on-site scheduled interpretive programs.

Overnight camping would continue to be a prohibited activity.

Resource Management. Natural resource management efforts would continue to emphasize inventory, monitoring, and trend analysis of nesting shorebirds and sea turtles from mid-March through September. Volunteer efforts would continue to extend the reach of existing staff in accomplishing this effort.

To minimize impacts on seagrass beds from vessel grounding, anchoring, and propeller scarring, a 300-yard nonmotorized zone along the entire north shoreline would be designated. Within this zone, travel corridors, targeted landing locations, and mooring buoys would be established to still allow for motor boat access. These locations might change over time as seagrass bed conditions change.

Operations Support. Operational support structures, entrance station, maintenance/ranger station, lifeguard station, emergency medical services, office space, and storage within the Opal Beach day use area would continue to be maintained. However, if the J. Earle Bowden Way is converted to a one-way evacuation lane and the structures are destroyed by a storm, they would not be rebuilt. The entrance station function would shift to the east and west entry point areas.

Utility service would continue to be provided to Opal Beach. However, if structures are destroyed by a storm, utility extensions would be removed back to the eastern beach access area, and they would be tied into the Pensacola Beach utility systems for the western beach access area.

Okaloosa Area

Access. Vehicular access to the Okaloosa Area would continue to be accommodated by U.S. Highway 98. Boat access to the Santa Rosa Sound would continue to be accommodated by an existing small boat launch ramp and a trailer parking area.

Visitor Opportunities. The swim beach recreation area at Okaloosa Beach, which includes a picnic area, shelters, and restroom facilities with outdoor showers, would continue to be maintained. On-site orientation and interpretive wayside exhibits would continue to be provided. Commercial use authorizations for recreational instruction activities that are self contained using mobile trailers, etc., would continue to be provided. Organized regatta events using nonmotorized vessels would continue to be accommodated through special use permits.

Resource Management. Natural resource management efforts would continue to emphasize inventory, monitoring, and trend analysis of nesting shorebirds. The site, situated on the eastern end of the national seashore, would continue to serve as an indicator of potential threats from outside disturbances.

The national seashore staff would seek cooperation with the Eglin AFB commander, the state, and surrounding municipalities and counties in regard to inventories and monitoring of natural and cultural resources on lands within the national seashore boundary.

Operations Support. The volunteer trailer pad would continue to be maintained, as would the site utilities serviced by the adjacent municipality.

AREA-SPECIFIC MANAGEMENT ACTIONS—MISSISSIPPI UNITS

Davis Bayou

Access. The 2.2 mile national seashore entrance road connecting to U.S. Highway 90 would continue to provide access to a number of recreational features within the Davis Bayou Area. Access would continue to be maintained to residential areas from the entrance road. Except for the VFW road, these roads would continue to dead-end in residential areas outside the national seashore requiring their access through the national seashore. Just before Gollott Road, the national seashore has established a road connection with the Gulf Coast Research Lab Cedar Point Facility. In the northwest section of the area, a fifth residential road, Robert McGhee Road, would remain gated and closed to auto traffic and used as walk-in access and part of the "Live Oak Bicycle Route" connecting Ocean Springs and Davis Bayou. It also would continue to provide for an alternative emergency vehicle access way into and out of the area. Planning for this area would evaluate the possible closure of the VFW road to vehicular traffic to assure the safety of pedestrians and bicyclists.

The public launch for motorized vessels would be phased out to minimize the need for dredging activities in the bayou. Water access for paddlers would continue to be accommodated. Adapt existing public fishing pier at the visitor center to also accommodate commercial water transportation service operators. Some dredging might be required.

Visitor Opportunities. The Davis Bayou Visitor Center would continue to be the national seashore's Mississippi hub for providing visitors with orientation, information, interpretive exhibits, and book sales. Indoor and outdoor interpretive and educational programs would continue to be provided at the visitor center and the campground amphitheater.

Water and land-based opportunities for exploration and learning about the Davis Bayou ecosystem would continue to be provided through guided tours and self-guided trails. If the bayou boathouse was destroyed in a storm, it would not be restored, although interpretive boat tours would continue.

Camping opportunities with access to power and water service hookups would continue to be provided. A "tent camping only" zone would be designated in the existing campground footprint (perhaps in the lower loop area) to separate trailer camping from tent camping.

Open space for group play would continue to be provided, as would picnic opportunities. Existing facilities would continue to be maintained.

Accessible fishing opportunities would continue to be provided. Commercial fishing guide service would continue to be permitted through commercial use authorizations.

Resource Management. Natural resource management efforts would continue to emphasize terrestrial vegetation and wildlife management, using prescribed fire to enhance wildlife habitat and reduce hazardous fuels. Methods would continue to be tested for restoring the wetland prairie ecosystems while maintaining adequate screening of adjacent neighborhoods. In partnership with the Gulf Coast Research Laboratory, the bayou and wetland systems would continue to be monitored, and conditions would continue to be assessed.

The effects of the existing culverts under the Davis Bayou road on the bayou system could be investigated during a hydrologic study. Culvert systems might be redesigned as needed to restore natural surface, tidal, and storm flows throughout the bayou system. Restoration efforts might include those to reverse the effects of mosquito ditching near Marsh Point.

Cultural resource management efforts would continue to emphasize ongoing stabilization efforts for the CCC cabins. Dedicated space in the visitor center would continue as an archival repository for specimens and objects collected in the Mississippi District.

Operations Support. The Davis Bayou Visitor Center would continue to provide administrative support space for Mississippi District staff. If additional space was needed to support expanded administrative functional needs, this would be accommodated in existing structures or outside the national seashore.

The Davis Bayou Area would continue to provide for district maintenance staging for office, shop, and storage space. If additional space was needed to support any expanded maintenance function needs, this would be accommodated within the existing maintenance compound.

NPS housing for seasonal staff, youth interns, and other partners would continue to be provided. To compensate for the seasonal/transient housing removed from the barrier islands, a dormitory and emergency shelter would be provided within the existing maintenance area development footprint.

The NPS marina area would continue to be maintained to support administrative access to Mississippi island areas.

Municipal utility service would continue to be provided from Ocean Springs.

Cat Island

Access. Access to the island could continue by way of private watercraft or limited commercial service. Unrestricted landings along the Gulf of Mexico shoreline would continue to be permitted, however landing locations on the Mississippi Sound side might be restricted to designated areas. A new NPS docking facility would be established to provide for administrative and commercial water transportation service use.

Visitor Opportunities. The island would continue to be managed as primitive area. Visitors would continue to be provided opportunities to explore areas of the island that are under federal ownership. Private lands would continue to be restricted from visitor use. Opportunities for primitive overnight camping would continue, although a permit system with designated sites on federal lands would be implemented to improve management of this activity.

No on-site interpretive or educational facilities would be provided. Davis Bayou Visitor Center would continue as the main source of information and interpretation of Cat Island's history and resources.

Resource Management. The site, situated on the western end of the national seashore, would continue to serve as a barometer of potential threats from outside perturbations.

The national seashore would coordinate with the Mississippi Department of Marine Resources and private landowners to establish strategies for minimizing impacts on seagrass beds. The national seashore would identify shoreline landing locations on federal lands to aid in this effort.

Upon completion of land acquisition, natural conditions would be restored to portions of the road and canal networks on federal lands that are no longer needed to provide visitor and/or private landowner access.

Cultural resource management efforts would continue to emphasize stabilization of the remnant features of the World War II Cat Island War Dog Reception and Training Center.

Additional research would be conducted to document the cultural history of the island and to map existing cultural features.

Operations Support. A small storage shed to assist with staging of materials and equipment would be provided on federal lands.

West Ship Island

Access. Access to the island would continue by way of private watercraft or commercial service. Access by water would continue to be permitted by private boat, with unrestricted landings along the Gulf of Mexico shoreline (except in designated swim areas). Landing locations on the Mississippi Sound side east of the dock would be restricted to designated areas. The existing NPS docking facility would continue to provide for loading and unloading of passengers and materials for a concession-operated water transportation service and national seashore personnel. A lateral pier connected to the existing NPS docking facility would be provided to accommodate safe loading and unloading of private watercraft passengers. Long-term docking of private watercraft would not be permitted.

Visitor Opportunities. A number of visitor facilities would continue to be provided, including comfort stations, a concession facility, and picnic/shade shelters.

If these facilities were destroyed by a storm, only the cross island boardwalk access and the north area comfort station would be rebuilt. All visitor services such as food, water, and equipment rental would be provided on board the commercial passenger ferry.

Guided and self-guided interpretive tours would continue within Fort Massachusetts. The North Guard Rooms would provide for a sheltered visitor contact area and accommodate Eastern National sales operations. The South Guard Room would continue to be used for showing the orientation film. Additional outdoor guided interpretive tours and educational programs would continue to be provided in other areas of the island. Interpretive waysides and a kiosk would continue to provide self-guided opportunities for interpretation and orientation.

Resource Management. Natural resource management efforts would continue to emphasize inventory, monitoring, and trend analysis of nesting shorebirds, sea turtles, and raptors, and establishment of closure areas around active nesting sites. Volunteer assistance in the sea turtle management program would continue to be limited because of the logistics of accessing the island.
In collaboration with other agencies and as funding allows, periodic mapping and monitoring of seagrass bed conditions would continue.

The national seashore would continue to collaborate with the U.S. Army Corps of Engineers to help restore the island's sediment transport and budget system that was disrupted by previous and ongoing dredging of adjacent navigation channels.

Fort Massachusetts would continue to be protected and stabilized, including beach nourishment.

To minimize impacts on seagrass beds from vessel grounding, anchoring, and propeller scarring, a seagrass protection zone would be designated along the north shoreline.

An alternative route for providing administrative access across the island would be developed to minimize impacts on wetland areas.

Operations Support. Operations support facilities would continue to be maintained on the island, including ranger residences, bunkhouse/first aid station, equipment shed, utilities, communication service, and a ranger boat pier.

East Ship Island

Access. Access to the island would continue by way of private watercraft or commercial service. Unrestricted landings along the Gulf of Mexico shoreline would continue to be permitted. Landing locations on the Mississippi Sound side would be restricted to designated areas.

Visitor Opportunities. The island would continue to be managed as primitive area.

Visitors would be provided opportunities to experience a natural barrier island where solitude and the need to be self-reliant provide inspiration and challenge. The primitive island environment would provide the senses with high quality scenic views, natural sounds, dark night skies, and natural scents. Opportunities for primitive overnight camping along the beach areas would continue. A permit system would be implemented requiring camping in designated areas. This would facilitate monitoring of visitor use and its effect on island resources. Depending on future use levels the permit system might be extended to day users (including off-shore anchoring or mooring) to protect island resources.

On-site visitor services and facilities would not be provided. Davis Bayou Visitor Center would continue as the main source of information to and interpretation of East Ship Island's history and resources.

Resource Management. Natural resource management efforts would continue to emphasize inventory, monitoring, and trend analysis of nesting shorebirds, sea turtles, and raptors, and establishment of closure areas around active nesting sites. Volunteer assistance in the sea turtle management program would continue to be limited in this area because of logistics.

The national seashore would continue to collaborate with the U. S. Army Corps of Engineers to help restore the island's sediment transport and sediment budget system that was disrupted by previous and ongoing dredging of adjacent navigation channels.

To minimize impacts on seagrass beds from vessel grounding, anchoring, and propeller scarring, a 300-yard nonmotorized zone would be designated along the entire north shoreline. Within this zone, travel corridors, targeted landing locations, and mooring buoys would be established to still allow for motor boat access. These locations might change over time as seagrass bed conditions change.

Plans to provide beach nourishment adjacent to the French Warehouse archeological site are being developed through the Mississippi Coastal Improvement Plan.

Operations Support. No on-site operations support facilities would be provided. Staff would need to respond to management issues via West Ship Island, Horn Island, or from Davis Bayou.

Horn and Petit Bois Islands (Designated Wilderness)

Access. Access to the islands would continue by way of private watercraft or commercial service. Unrestricted landings along the Gulf of Mexico shoreline would continue to be permitted. Landing locations on the Mississippi Sound side would be restricted to designated areas. The existing NPS docking facility on Horn Island would continue to be used for administrative purposes.

Visitor Opportunities. Visitors would have opportunities to experience a barrier island wilderness, untrammeled by man, where solitude and the need to be self-reliant provide inspiration and challenge. The primitive island environment would provide the senses with high quality scenic views, natural sounds, dark night skies, and natural scents. Visitor services and facilities would continue to be limited, with only the island cross-over trail maintained. Opportunities for primitive overnight camping along the beach areas of the island wilderness would continue. A permit system would be implemented requiring camping in designated areas. This would facilitate monitoring of visitor use and its effect on island resources. Depending on future use levels the permit system might be extended to day users (including off-shore anchoring or mooring) to protect island wilderness characteristics.

The Davis Bayou Visitor Center would continue to provide interpretation of Horn and Petit Bois Island's history and resources, as well as education on wilderness values, appropriate uses, and potential hazards. An

interpretive wayside and/or kiosk would be added in the administrative enclave area to provide visitors with on-site information regarding the wilderness values, appropriate uses, and potential hazards.

Resource Management. Natural resource management efforts would continue to emphasize inventory, monitoring, and trend analysis of nesting shorebirds, sea turtles, and raptors, and establishment of closure areas around active nesting sites. Volunteer assistance in the sea turtle management program would continue to be limited in this area because of logistics.

The national seashore staff would continue to collaborate with the U. S. Army Corps of Engineers to help restore the island's sediment transport and budget system that was disrupted by previous and ongoing dredging of adjacent navigation channels.

The national seashore staff would continue to coordinate with the U.S. Department of Agriculture to eradicate the exotic cactus moth from the island.

To minimize impacts on seagrass beds from vessel grounding, anchoring, and propeller scarring, a 300-yard nonmotorized zone would be designated along the entire north shoreline. Within this zone, travel corridors, targeted landing locations, and mooring buoys would be established to still allow for motor boat access. These locations might change over time as seagrass bed conditions change.

Within the administrative enclave area on Horn Island, the use of the tractor trail between the dock and administrative area would be discontinued.

Operations Support. No on-site operations support facilities would be provided on Petit Bois Island. Staff would need to respond to management issues via West Ship Island, Horn Island, or from Davis Bayou.

On Horn Island, a small operations support center would continue to be maintained in the administrative enclave area, including ranger residences, bunk, and office complex, and a dock.

If administrative facilities (excluding the dock) were destroyed by a storm, they would not be rebuilt. Visitor and resource protection response would be based out of Davis Bayou Area or from West Ship Island. The use of a temporary houseboat could provide accommodations for mobile short-term housing and logistical support for transient staff and cooperators.

STAFFING AND COSTS

The staffing level under alternative 2 would be 98.5 full-time equivalent (FTE) staffing positions. Currently, the national seashore is authorized to have 111 FTE and therefore, this alternative would not require additional staffing beyond the authorized amount. Instead, the 12.5 FTE employees above the current level would support resource stewardship and visitor services envisioned under this alternative. The breakdown of additional staffing needs by each management division is presented below.

The Superintendent's Office and Administrative Division would seek an increase in 2 full-time-equivalent employees bringing their division's total to 12 full-time-equivalent employees to manage an expanded commercial services program, manage an expanded partnership program, and provide IT (information technology) support for both districts.

The Resource and Visitor Protection Division would shift some visitor use assistant positions to law enforcement and seek an additional 2.5 full-time-equivalent employees, bringing their division's total to 33.5 full-time-equivalent employees to support an increase in patrols within the marine environment, increase patrols on Cat Island, accommodate increase in response times for routine patrols and emergency situations on the Mississippi Islands, and implement the camping permit system.

The Interpretive Division would not seek additional full-time-equivalent employees under this alternative.

The Science and Resources Management Division would seek an increase of 5 full-time-equivalent employees bringing their division's total to 14 full-time-equivalent employees to establish resource management programs for the marine environment and cultural resources, initiate resource inventory and monitoring efforts for Cat Island and on Eglin Air Force Base managed lands within the national seashore, and support expanded research programs coordinated through partnerships, and possibly initiate cultural resource stabilization efforts for the Pensacola Lighthouse complex.

The Facility Management Division would seek an additional 3 full-time-equivalent employees bringing their division's total to 29 full-time-equivalent employees to proactively manage the deferred maintenance program, support new maintenance responsibilities at Fort Pickens, Naval Live Oaks, Davis Bayou, and Cat Island and possibly the Pensacola Lighthouse complex; and to maintain an expanded fleet of marine vessels needed for enhanced resource management and protection efforts. Volunteers and partnerships would continue to be key contributors to NPS operations.

The cost estimates provided here are given for comparison to other alternatives only; they are not to be used for budgeting purposes. Although the numbers appear to be absolutes, they represent a midpoint in a possible range of costs. The total one-time cost for new facilities under this alternative is estimated at $9,900,000. Annual operating costs under this alternative would be $8,542,000. Presentation of these costs in this plan does not guarantee future NPS funding. Project funding would not come all at once; it would likely take many years to secure and may be provided by partners, donations, or other nonfederal sources. Although the national seashore hopes to secure this funding and would prepare itself accordingly, the national seashore may not receive enough funding to achieve all desired conditions within the timeframe of the *General Management Plan* (the next 20 or more years).

ALTERNATIVE 3 (NPS PREFERRED ALTERNATIVE)

CONCEPT

Gulf Islands National Seashore would be managed as an outdoor classroom for exploring the natural and human history of the northern Gulf Coast while providing seashore recreational opportunities. Collaboration and cooperation between a consortium of academia, visiting scientists, conservation organizations, and other agencies would be actively pursued to enhance resource management, stewardship, and understanding of the northern gulf coastal environment.

Visitor Experience

Similar to alternative 1, the national seashore would continue to include opportunities for beach activities, boating, fishing, camping, picnicking, biking, motor touring, back-country use, exploration of coastal fortifications, and other uses compatible with the protection of the national seashore's scenic, natural, and cultural values. These opportunities would range from recreating with large groups within developed to semideveloped areas to finding solitude within an undeveloped wilderness island setting.

The interpretive program would continue to foster public awareness and appreciation of the fundamental resources and values of the national seashore. However, greater emphasis would be placed on using the national seashore as an outdoor classroom to provide visitors with expanded on-site learning opportunities. The national seashore would establish an environmental education center and develop an active stewardship program while providing educational and interpretive opportunities that explore the role that natural systems and coastal fortifications have played in the area.

History would be brought to life at selected coastal fortifications by actively presenting stories of important periods of their history. With historic or reproduction cannon and other objects, visitors would be able to visualize and learn about the role of coastal defense to protect mainland communities. At other sites, interpretive programs would focus on the natural and cultural significance of these barrier islands over time.

Visitors would also be provided with guided and self-guided opportunities to explore coastal ecology and the natural settings that illustrate how barrier islands provide protection to the mainland coastline from the effects of major storms.

National seashore programs could include opportunities for visitors to observe preservation activities including stabilization and data collection.

Provisions to ensure safe visitor use and enjoyment would include providing lifeguard personnel at designated swim beach areas and law enforcement patrols with search and rescue capabilities. Educational information would also be provided on the hazards of recreating in the natural environment and exploring historic structures. As part of the marine resource management plan, opportunities for enhanced scuba diving and snorkeling, including environmental education, would be considered.

Natural Resource Conditions

Natural resources would be managed to preserve the integrity of the national seashore's fundamental terrestrial, estuarine, and marine ecological resources while providing visitor access to seashore settings that best illustrate the natural evolution of geologic, environmental, and ecological processes and/or the area's collection of heritage resources. Exceptional and critical natural resources and processes would continue to be managed to preserve their intrinsic values. As funding permits, these areas would continue to be

inventoried, evaluated, monitored, protected, and preserved in accordance with the NPS policies and legislative and executive requirements. Strategies would continue to be developed to protect resources and conduct data collection where threats have been identified. Restoration efforts would focus on reestablishing natural resource conditions that have been altered or impacted by human activity; however, natural resource manipulations would continue in areas surrounding coastal fortifications to ensure protection from threats to their stability and integrity posed by continuing shoreline changes.

The key component for achieving the desired natural resource conditions under this alternative would include establishing a marine management program to inventory and monitor the overall marine environment, including submerged cultural resources. To support this initiative, collaboration, coordination, and cooperation between a consortium of academia, visiting scientists, conservation organizations, and other agencies would be encouraged and actively pursued. This would also include hosting symposiums to promote coastal resource management, stewardship, and understanding of the northern gulf coastal ecosystem. Enhanced scientific study and research would accelerate the awareness of the national seashore's ecological health and vitality, anticipate/adapt to the effects of climate change, promote restoration of disturbed sites, improve communication with the public about the dynamic natural processes of the area, and inform the expanded educational programs envisioned under this alternative. Restoration would use emerging information related to natural resources and natural processes and would help eliminate identified adverse effects to these resources.

Also under this alternative, natural resources could be modified to restore cultural landscape characteristics to enhance education and interpretive opportunities.

Cultural Resource Conditions

Under this alternative, a cultural resource management program would be established to compliment the marine management program discussed above. Cultural landscapes and submerged cultural resources would be identified and documented, and preservation strategies would be developed. All accessioned museum objects pertinent to the national seashore, except for archeological artifacts stored at the NPS Southeast Archeological Center in Tallahassee, Florida, would be consolidated in one multi-park and jointly administered facility as identified in the 2006 NPS Southeast Region Collections Management Plan. This consolidation of museum objects includes the national seashore's natural history collections as well.

Selected historic forts, artillery batteries, and associated structures would be rehabilitated to portray their appearance/function during a specific operational period(s). Actions would not alter the integrity of historic properties to allow for the enhancement of visitor experience. Extensive acquisition of natural and cultural museum objects would be used to document the regional gulf coast environment and serve as an important component of the national seashore's interpretive program and regional information base.

Similar to alternative 1 and as funding permits, the national seashore would continue to inventory areas that have not yet been documented. These resources would be evaluated, monitored, and protected in accordance with the NPS historic preservation policies and legislative and executive requirements. Strategies would continue to be developed to stabilize resources or to conduct data collection where threats have been identified.

AREA-SPECIFIC MANAGEMENT ACTIONS—FLORIDA UNITS

Naval Live Oaks Area

Access. Similar to alternative 1, access by land would continue via U.S. Highway 98. The national seashore staff would continue to coordinate with local and state officials to improve safe highway access to and from U.S. 98 and national seashore developed areas. The existing bicycle/pedestrian trail connection along the south side of U.S. 98 would continue to provide visitors with an alternative means of accessing the Naval Live Oaks Area.

Access by water would continue to be permitted by private boat; however, under this alternative, options for boat landings along the Pensacola Bay and Santa Rosa Sound shorelines might be restricted to designated areas. In addition, to encourage safe public access by water and to protect seagrass beds, a dock facility (no ramp) might be provided on the Santa Rosa Sound side near the visitor center.

Visitor Opportunities. Similar to alternative 1, visitor orientation/interpretation and book sales at the existing Naval Live Oaks Visitor Center would continue to be provided. Under this alternative, the existing headquarters space would be adapted to establish an environmental education and research center, supporting the expansion of education opportunities highlighted in this alternativeA collaboration of academia, scientists, public agencies, and other conservation organizations would be pursued to enhance opportunities for research and education.

After completing a cultural landscape report, a small portion of the historic live oak plantation (< 5 acres) could be managed to reflect historic plantation conditions for interpretive/educational purposes.

Similar to alternative 1, day-use opportunities, including interpretive nature trails, would continue to be provided to areas of special interest on both the north and south sides of U.S. 98, a formalized picnic area with comfort stations, primitive picnic and beach access area (with no restrooms or changing areas), and organized youth group camping. However, under this alternative the use of the youth group camping area would be expanded to allow organized educational/research groups.

Resource Management. Natural resource management efforts would continue to emphasize terrestrial vegetation and wildlife management—using prescribed fire to enhance wildlife habitat and reduce hazardous fuels. Monitoring efforts would continue to assess trends in the resident gopher tortoise population.

Similar to alternative 2, a seagrass bed protection zone would be designated along the north and south shoreline areas, extending into the Santa Rosa Sound and Pensacola Bay.

Parking areas would not be expanded, although the paving would be replaced with permeable surfacing to promote stormwater infiltration into the soil and reduced stormwater runoff.

Cultural resource management efforts would continue to be supported by the NPS Southeast Archeological Center, who periodically provide monitoring and assessment of archeological resources conditions.

Operations Support. To accommodate the administrative staff displaced with the conversion of the existing headquarters space into an education learning/research center, a new administrative facility would be constructed in the fenced area of the north maintenance compound.This new facility would provide much-needed space for administrative offices because the current office space has been too small since 1988, when trailers were used to provide extra office space for headquarters staff. If new office space is not provided in the north maintenance compound area, the use of trailers to provide expanded office space may become necessary again in the future. The construction of new administrative office space specified under this alternative would

be a lower cost than leasing administrative office space outside the national seashore.

In addition, a new maintenance facility would be constructed in the same area to house the Florida district maintenance operations. Dedicated space for resource management support including a fire cache would also be accommodated in the new facility. The utility service would be upgraded and consolidated to accommodate the new maintenance facility. Both the new administrative facility and the new maintenance facility would be constructed on previously disturbed areas in the north maintenance compound. This alternative would be consistute a lower cost in the long-run than the trailers that are currently used at the maintenance area, because long-term total costs for trailers are higher than construction of a sustainable, appropriately designed facility.

Pensacola Naval Air Station Historic Sites

Access. Similar to alternative 1, access by land would continue using the main entrance to the Pensacola Naval Air Station via Florida State Highway 292 and going 1 mile south on Florida State Highway 295. Depending on national security level alerts, public access into Naval Air Station grounds might continue to be restricted.

Visitor Opportunities. Similar to alternative 1, the contemporary visitor center and bookstore would continue to provide orientation to and overall interpretation of the historic sites in the Pensacola Naval Air Station. Fort Barrancas, Bateria de San Antonio (Water Battery), and Advanced Redoubt would continue to be available for visitor exploration. In addition, if management of the Pensacola Lighthouse complex is transferred to the National Park Service, provision for exterior interpretation of the complex would be programmed; the keeper's quarters would be adaptively rehabilitated for use as a visitor contact station and bookstore with managed visitor access into the lighthouse interior. Staff offices may also be housed in the interior. Additional interpretive exhibits would be programmed.

After completion of a cultural landscape report, historic sites in this area would be managed as cultural landscapes. Selected features could be restored to portray their appearance/function during specific historic operational periods for interpretive/educational purposes.

The Trench Trail connecting Fort Barrancas and the Advanced Redoubt and the Woodland Nature Trail would continue to provide visitors an opportunity to explore the historic grounds by foot. Opportunities to provide a trail connection between Fort Barrancas and the Pensacola Lighthouse complex would be explored in consultation with Naval Air Station command. Picnic facilities would continue to be provided near Fort Barrancas and the Advanced Redoubt.

Resource Management. Cultural resource management efforts would continue to emphasize ongoing stabilization efforts to preserve Fort Barrancas, Bateria de San Antonio (Water Battery), and Advanced Redoubt. Because Fort Barrancas is a National Historic Landmark, the highest historical designation a structure can be given, it would be afforded special protection and impacts would be minimized. If management of the Pensacola Lighthouse were transferred to the National Park Service, stabilization and rehabilitation efforts would be assessed, programmed, and initiated.

The national seashore would enhance their coordination efforts with the Naval Air Station command to maintain the historic viewshed of Fort Pickens, Pensacola Pass, and Fort McRee areas.

Operations Support. Staff office space would continue to be provided in the Fort Barrancas Visitor Center and potentially in the keeper's quarters if the Pensacola Lighthouse complex transfers to the national seashore.

Perdido Key Area

Access. Similar to alternative 1, access by land would continue from Florida State Highway 292. Johnson Beach Road would continue to provide for road shoulder parking with designated dune crossovers providing multiple access points to the beach along the Gulf of Mexico and the lagoon side. The road would continue to extend 2.4 miles east with a turnaround drop-off area at the terminus. The last 0.5 mile would remain closed to parking. However, if the road beyond Johnson Beach sustains more than 50% destruction from a storm, the road beyond Johnson Beach would not be rebuilt and natural conditions would be restored. The transportation corridor would transition into a multipurpose trail limited to pedestrian or bicycle use only.

Access by water would continue to be permitted by private boat, with unrestricted landings along the Gulf of Mexico shoreline (except in designated swim areas).

Depending on adaptive management measures implemented by national seashore staff to protect seagrass beds, landing locations on the Big Lagoon side might be restricted to designated areas.

Visitor Opportunities. A recreation area at Johnson Beach would continue to be provided, with restrooms, parking, covered picnic facilities, and lifeguarded swim beach, as well as the small boat launch area and parking for canoe, kayak, and other small boat use on the lagoon side just north of the beach.

Interpretive opportunities throughout the area would be expanded, including interpreting the history of Rosamond Johnson Beach and maintaining the Discovery Trail on the north side of Perdido Key. The Rosamond Johnson Beach was a segregated beach in the mid-1900s, and this history would be interpreted for visitors. Additional educational opportunities would be introduced by way of a mobile interpretive/educational vehicle. Expanded interpretive/educational opportunities could be provided under this alternative, such as establishing interpretive canoe and kayak trails within Big Lagoon, providing regularly scheduled curriculum-based school programs in the area, and providing on-site interpretive programs of Fort McRee by way of tour boats.

The eastern side of Perdido Key would continue to be a popular anchorage, with heavy visitor use accessing the eastern tip. To minimize impacts on the environment and to provide for enhanced service for recreational users, additional restroom facilities (vault or composting toilets) would be provided within the eastern tip area of the key.
Primitive camping would continue to be allowed 0.5 mile beyond the end of the road, although a permit system might be established for all overnight camping (land based and overnight mooring of boats).

Resource Management. Natural resource management efforts would continue to emphasize inventory, monitoring, and trend analysis of nesting shorebirds and sea turtles from mid-March through September. Volunteer efforts would continue to extend the reach of existing staff in accomplishing this effort. The national seashore staff would continue to collaborate with the U.S. Fish and Wildlife Service in assessing the conditions of the resident Perdido Key beach mouse populations.

To minimize damage to seagrass beds from vessel grounding, anchoring, and propeller scarring, a seagrass bed protection zone would be designated along the north shoreline of NPS lands on Perdido Key.

Cultural resource management efforts would continue to emphasize ongoing stabilization efforts to preserve the remnant batteries and seawall of Fort McRee.

Operations Support. The ranger station, entrance station, maintenance shop, and trailer pad for volunteer housing would continue to be maintained.

Fort Pickens Area

Access. Fort Pickens Road would continue to provide vehicular access between Pensacola Beach and the Fort Pickens Area. The intent of the national seashore is to reconstruct the road after major storms, if feasible. The National Park Service intends to continue access via Fort Pickens Road to Fort Pickens, but there are situations that may arise in the future where conditions become so altered that it is no longer feasible to build or maintain the road. This would be determined on a case-by-case basis. Costs for rebuilding could be high, and at this time they are unknown because the severity or damage of future storm is unknown. Other options to provide access to Fort Pickens would be considered given the circumstances of the storm(s) or other events that may cause such a decision to become necessary. The national seashore's hurricane recovery plan would include a provision to procure and deploy, if feasible, temporary surfacing to accommodate administrative vehicular and public foot/bike access to the Fort Pickens Area until road repairs could be completed after major storms.

Two small beach access areas with parking would continue to be provided and possibly expanded along Fort Pickens Road. Bike and pedestrian access would continue to be permitted along the road shoulders. Other designated bike trail opportunities would continue between the campground and Fort Pickens. The route could also be made available for a shuttle system or trolley service, if such a system were found to be feasible in the future.

Access by water would continue to be permitted by private boat, with unrestricted landings along the Gulf of Mexico shoreline (except in designated swim areas).

To enhance visitor access by water, a new passenger ferry pier will be constructed to accommodate commercial water-based transportation service and NPS administrative use. Planning for this pier is currently underway (via the Fort Pickens Ferry Pier Environmental Assessment and public process). If feasible, the pier may provide private boaters a safer opportunity to load and unload passengers. Land-based connections to the ferry pier and other ground transportation options in the Fort Pickens area would be explored.

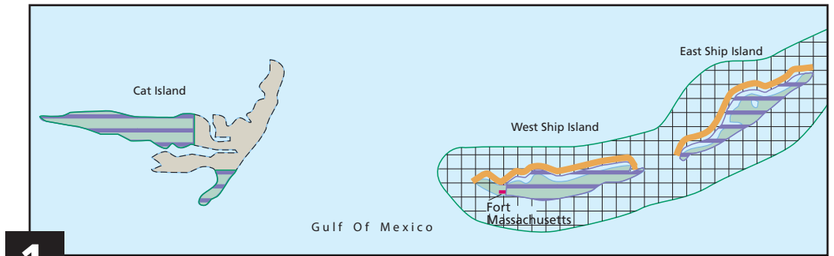
Visitor Opportunities. Historic structures in Fort Pickens would continue to be used to support visitor services. This would include the Fort Pickens visitor center and bookstore; Batteries Cooper and Worth for interpretive programs; the firehouse for concession food service and adjacent public restrooms; the mining casemate for public restrooms, library, Eastern National office and storage; and Building 5 for auditorium, museum, and staff offices. Other portions of the district might be rehabilitated to portray their historic appearance and function with incorporated interpretive media to enhance visitor understanding. If funded and supported through partnership efforts, other areas could be adaptively rehabilitated to accommodate a shared educational and research facility.

The downstairs interior of the Fort Pickens Ranger Station might be rehabilitated to portray its historic appearance/function with incorporated interpretive media to enhance visitor understanding of the Lifesaving Service.

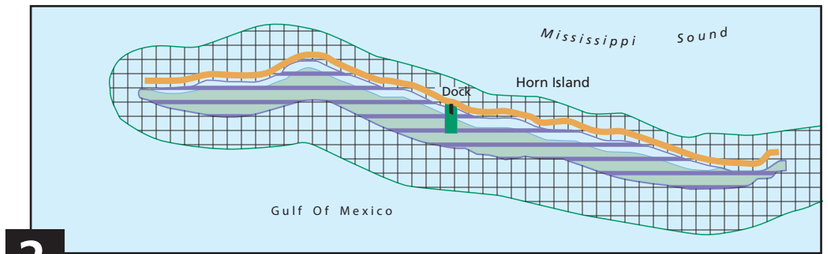
Contemporary structures would continue to be maintained to support visitor services, such as the entrance station, the jetties restroom (near fishing pier), Battery Worth picnic shelter and restroom, and Little Langdon picnic shelter and restroom.

The swim beach recreation area at Langdon Beach would continue to have lifeguard services, the picnic shelter, restroom/changing rooms, and outdoor showers.

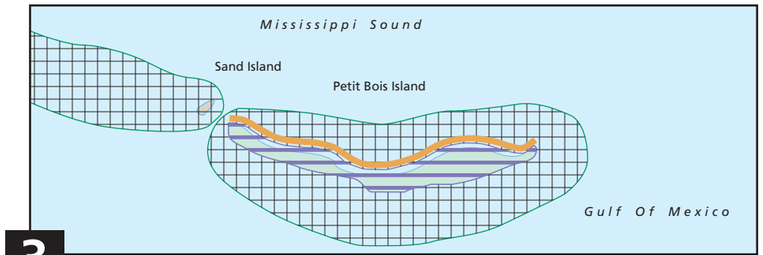
The contemporary campground would continue to be maintained, with individual and group sites, restrooms, dump station, and electrical hookups. A "tent camping only" zone would be designated in Loop A to separate RV camping from tent camping.



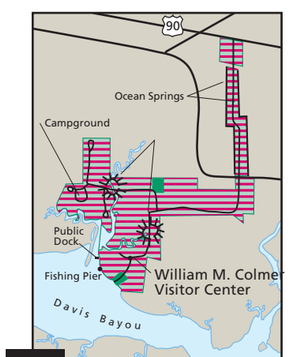
1 Cat Island, West Ship Island, East Ship Island



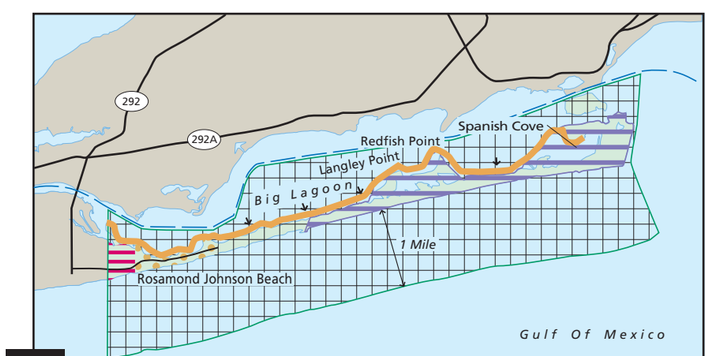
2 Horn Island



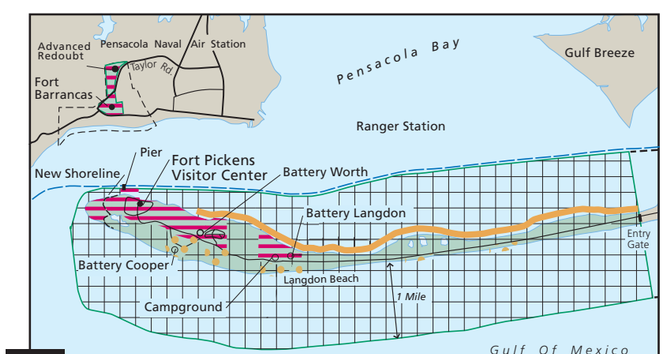
3 Petit Bois Island



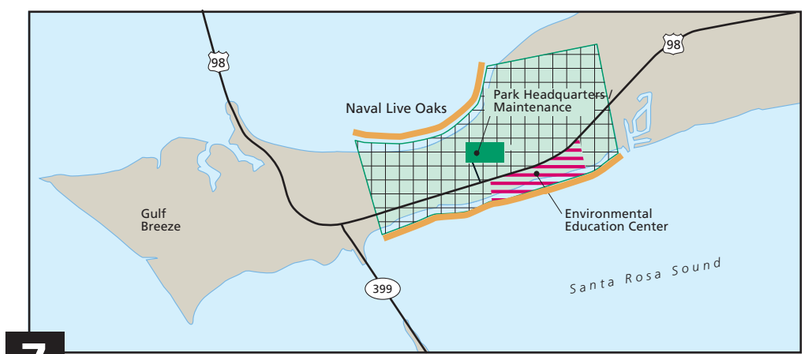
4 Davis Bayou



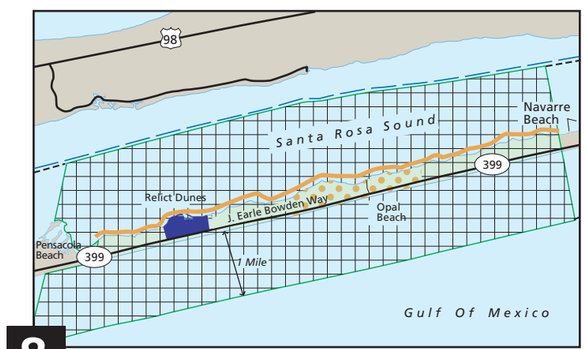
5 Perdido Key



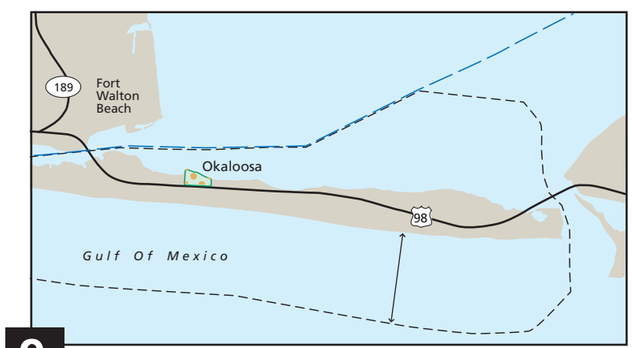
6 Fort Pickens / Fort Barrancas



7 Naval Live Oaks



8 Santa Rosa Area



9 Okaloosa

- Intracoastal Waterway
- Administrative Boundary
- Legislative Boundary
- Non NPS Lands
- NPS Lands

ZONES

- Natural Settings With Dispersed Recreation
- Diverse Visitor Opportunities
- Recreational Beaches
- Resources Management and Science Priority
- Non-motorized Primitive Visitor Opportunities
- National Seashore Operations
- Seagrass Bed Protection

Gulf Islands National Seashore Map Key

North

Not to scale

ALTERNATIVE 3

Gulf Islands National Seashore

Mississippi • Florida

National Park Service / U.S. Department of the Interior

The Campground Store would be replaced with a new structure that could accommodate campground registration and Campground Store functions. Additional parking and circulation improvements would be provided to accommodate additional functions.

The contemporary amphitheater structure would continue to be provided for interpretive and educational programs.

Fishing and sightseeing opportunities would continue to be provided at the fishing pier.

Interpretive trails would continue to be provided, including the Blackbird Marsh Trail, Dune Nature Trail, Fort Pickens self-guided tour, and cross-over trail. Additional boardwalk beach crossovers would continue to be provided as needed to minimize resource damage, such as near Battery 234 (lookout tower) and batteries Cooper and Payne. NPS staff would continue to support the Florida National Scenic Trail and terminus in the Fort Pickens Area.

Resource Management. Natural resource management efforts would continue to emphasize inventory, monitoring, and trend analysis of nesting shorebirds and sea turtles from mid-March through September. Volunteer efforts would continue to extend the reach of existing staff in accomplishing this effort.

To minimize damage to seagrass beds from vessel grounding, anchoring, and propeller scarring, a seagrass bed protection zone would be designated along the north shoreline of NPS lands between Battery Worth and Pensacola Beach.

Cultural resource management efforts would continue to emphasize ongoing stabilization efforts to preserve historic structures within Fort Pickens as well as the structures associated with the Fort Pickens Ranger Station.

Operations Support. Historic structures within Fort Pickens would continue to be used to support Florida District operations and NPS housing. The use of other historic structures for expanded housing opportunities would be considered.

With the conversion of the Fort Pickens Ranger Station for visitor use, the ranger station, resource and visitor protection and science and resources management district office space would be relocated into other historic structures in the Fort Pickens Area. The campground registration function would be relocated to a newly constructed building at the Campground Store site.

A majority of the Florida District maintenance functions would be relocated into a new maintenance complex constructed in the Naval Live Oaks north compound area. A limited maintenance staging presence would be maintained using historic structures to accommodate l storage and shop space.

Contemporary structures that include the chlorinator building and well head building would continue to be maintained to support the area's water system. Use of the carpenter shop would be discontinued, and the structure would be removed.

Utility services (telephone, power and sanitation) would continue to be provided. The on-site wells and water distribution system would continue to be maintained. The feasibility of underwater electrical service would be assessed.

Santa Rosa Area

Access. J. Earle Bowden Way, SR 399 (7 miles) would continue to be maintained as a two-way vehicular public access road and evacuation route between Pensacola Beach and Navarre Beach. Parking would continue to be allowed only in designated areas, and parking on road shoulders would continue to be prohibited. Bike and pedestrian access would continue to be allowed along the road shoulders. In addition to the established recreational beaches at Opal Beach, three beach access areas would continue to be allowed along the road with dune crossovers. The route could

also be made available for a shuttle system or trolley service with shelters, if such a system were found to be feasible in the future.

Access by water would continue to be permitted by private boat, with unrestricted landings along the Gulf of Mexico shoreline (except in designated swim areas).

Visitor Opportunities. The swim beach recreation area at Opal Beach would continue to be provided. However, if structures are destroyed by a storm, best available technology and design will be considered when deciding what type of facility and what materials will be chosen to replace the structure.

A permit system for primitive camping in designated areas may be implemented for group educational programs, through hikers, and long distance paddlers. NPS staff would coordinate with regional efforts to establish a canoe route from Perdido Key River running eastward.

NPS staff would continue to support the routing of the Florida National Scenic Trail through the area. Seasonal restrictions on recreation along the route might be applied during critical nesting periods for shorebirds and turtles.

Wayside exhibits would continue to be maintained, as would on-site scheduled interpretive programs. Educational opportunities would be introduced by way of a mobile interpretive/educational vehicle.

Commercial services might be permitted to support on-site recreational activities.

Resource Management. Natural resource management efforts would continue to emphasize inventory, monitoring, and trend analysis of nesting shorebirds and sea turtles from mid-March through September. Volunteer efforts would continue to extend the reach of existing staff in accomplishing this effort.

To minimize impacts on seagrass beds from vessel grounding, anchoring, and propeller scarring, a seagrass bed protection zone would be designated along the north shoreline.

Operations Support. Operational support structures, entrance station, maintenance/ranger station, lifeguard station, emergency medical services, office space, and storage within the Opal Beach day use area would continue to be maintained. However, if structures are destroyed by a storm, best available technology and design will be considered when deciding what type of facility and what materials will be chosen to replace the structure.

Utility service would continue to be provided to Opal Beach.

Okaloosa Area

Access. Vehicular access to the Okaloosa Area would continue to be accommodated by U.S. Highway 98. Boat access to the Santa Rosa Sound would continue to be accommodated by an existing small boat launch ramp and a trailer parking area.

Visitor Opportunities. The swim beach recreation area at Okaloosa Beach which includes a picnic area, shelters, and restroom facilities with outdoor showers, would continue to be maintained. A gateway presence would be established, and additional structures (shade/picnic) and services would be introduced to support day use. Educational opportunities would be introduced by way of a mobile interpretive/educational vehicle. Commercial use authorizations would continue to be allowed for recreational instruction activities that are self-contained using mobile trailers, etc. Organized regatta events would continue to be accommodated using nonmotorized vessels through special use permits.

Commercial services might be permitted to support on-site recreational activities.

Resource Management. Natural resource management efforts would continue to emphasize inventory, monitoring, and trend analysis of nesting shorebirds. The site, situated on the eastern end of the national seashore, would also serve as a barometer of potential threats from outside perturbations.

The national seashore staff would seek cooperation with the Eglin AFB commander, the state, and surrounding municipalities and counties in regard to inventories and monitoring of natural and cultural resources on lands within the national seashore boundary.

Operations Support. An on-site presence would be maintained by maintaining the volunteer trailer pad. Site utilities that are serviced by adjacent municipality would be maintained.

AREA-SPECIFIC MANAGEMENT ACTIONS—MISSISSIPPI UNITS

Davis Bayou

Access. The 2.2-mile national seashore entrance road connecting to U.S. Highway 90 would continue to provide access to a number of recreational features within the Davis Bayou Area. Access would continue to be maintained to residential areas from the entrance road. Except for the VFW road, these roads would continue to dead-end in residential areas outside the national seashore requiring their access through the national seashore. Just before Gollott Road, the national seashore has established a road connection with the Gulf Coast Research Laboratory Cedar Point Facility. In the northwest section of the area, a fifth residential road, Robert McGhee Road, would continue to be gated and closed to auto traffic and used as walk-in access and part of the "Live Oak Bicycle Route" connecting Ocean Springs and Davis Bayou. It would also continue to provide for an alternative emergency vehicle access way into and out of the area. Planning for this area would evaluate the possible closure of the VFW road to vehicular traffic to assure the safety of pedestrians and bicyclists.

Under this alternative, the national seashore would also evaluate the potential for a multi-use bicycle/pedestrian trail along Park Road.

Water access for private boats to and from the Mississippi Sound would continue to be provided by the existing boat ramp. Water access for paddlers would continue to be provided at the existing boat launch facility. The public fishing pier at the visitor center would be adapted to also accommodate commercial water transportation service operators. Some dredging might be required.

Visitor Opportunities. The Davis Bayou Visitor Center would continue to be the national seashore's Mississippi hub for providing visitors with orientation, information, interpretive exhibits, and book sales. Indoor and outdoor interpretive and educational programs would continue to be provided at the visitor center and the campground amphitheater. To accommodate larger groups and expanded interpretive programs, a new amphitheater pavilion might be constructed near the Davis Bayou Visitor Center.

Visitors would continue to have water- and land-based opportunities for exploration and learning about the Davis Bayou ecosystem through guided and self-guided interpretive nature trails and guided interpretive boat tours. Short hiking trails could also be developed in the Davis Bayou area for visitors and staff to access different areas of the unit and possibly join into a trail system being developed at the Gulf Coast Research Laboratory Cedar Point facility. The old well shed would be adapted to accommodate an environmental learning classroom area. The scenic viewshed around Davis Bayou would be maintained.

NPS staff would continue to partner with the University of Southern Mississippi Gulf Coast Research Laboratory Cedar Point facility on their plans for a new visitor center on aqua culture and possibly a new marine education

center that could be built there. Partnerships with additional universities would support shared educational and research facilities. The consortium could help fund and manage a facility based at or near Davis Bayou. A collaboration of academia, scientists, public agencies, and other conservation organizations would be pursued to enhance opportunities for research and education.

Camping opportunities with access to power and water service hookups would continue to be provided. A "tent camping only" zone would be designated within the existing campground footprint (perhaps in the lower loop area) to separate trailer camping from tent camping.

The open space near the Davis Bayou campground area would be used for outdoor environmental education and/or restored to a more natural environment. Recreational facilities at Davis Bayou, including the ball field, backstop, and basketball court, may be removed and the areas restored for outdoor education or to provide a more natural environment. Picnic opportunities would continue to be provided.

Accessible fishing opportunities would continue to be provided. Commercial fishing guide service would continue to be permitted through commercial use authorizations.

Resource Management. Natural resource management efforts would continue to emphasize terrestrial vegetation and wildlife management, using prescribed fire to enhance wildlife habitat and reduce hazardous fuels. Methods would continue to be tested for restoring the wetland prairie ecosystems while maintaining adequate screening of adjacent neighborhoods. In partnership with the Gulf Coast Research Laboratory, the bayou and wetland systems would continue to be monitored, and conditions would continue to be assessed.

The effects of the existing culverts under the Davis Bayou road on the bayou system could be investigated during a hydrologic study. Culvert systems might be redesigned as needed to restore natural surface, tidal, and storm flows throughout the bayou system. Restoration efforts might include those to reverse the effects of mosquito ditching near Marsh Point.

Cultural resource management efforts would continue to emphasize ongoing stabilization efforts for the CCC cabins. Dedicated space in the visitor center would continue as an archival repository for specimens and objects collected in the Mississippi District.

Operations Support. The Davis Bayou Visitor Center would continue to provide administrative support space for Mississippi District staff. If additional space was needed to support expanded administrative functional needs, this would be accommodated in a leased or new structure located in another existing or previously developed area.

The Davis Bayou Area would continue to provide for district maintenance staging for office, shop, and storage space. If additional space was needed to support any expanded maintenance function needs, this would be accommodated in the maintenance compound.

NPS housing for seasonal staff, youth interns, and other partners would continue to be provided. Some NPS housing at Davis Bayou may be used as housing for permanent staff that are duty-stationed on the islands on their lieu days.

The existing NPS marina area would continue to support administrative access to Mississippi island areas.

Utility service would continue to be provided from Ocean Springs.

Cat Island

Access. Access to the island would continue by way of private watercraft or limited commercial service. Unrestricted landings along the Gulf of Mexico shoreline would continue to be permitted; however, landing locations

on the Mississippi Sound side might be restricted to designated areas. A new NPS docking facility would be established on federal lands to provide for administrative and commercial water transportation service use. Access via the canal system on Cat Island is crucial for administrative and visitor access to the island. Negotiations with the private landowner would be required to secure such access.

Visitor Opportunities. The island would continue to be managed as a primitive area. Visitors would continue to be provided opportunities to explore areas of the island that are under federal ownership. Private lands would continue to be restricted from visitor use. Opportunities for primitive overnight camping would continue, although a permit system with designated sites on federal lands would be implemented to improve management of this activity. Upon completion of land acquisition, a group campsite (with backcountry-type toilet facility) would be established to accommodate organized, educational groups. The national seashore would also establish a hiking trail system throughout federal lands of the island using portions of the existing road network.

The Davis Bayou Visitor Center would continue as the main source of information to and interpretation of Cat Island's history and resources. Interpretive waysides at points of interest would be provided on federal lands. Guided interpretive tours and educational programs might also be provided.

Resource Management. Natural resource inventories would be initiated for federal lands on the island. The national seashore staff would coordinate with the Mississippi Department of Marine Resources and private landowners to establish strategies for minimizing impacts on seagrass beds. The national seashore would identify shoreline landing locations on federal lands to aid in this effort. Upon completion of land acquisition, natural conditions would be restored to portions of the road and canal networks on federal lands that are no longer needed to provide visitor and/or private landowner access.

Cultural resource management efforts would continue to emphasize stabilization of the remnant features of the World War II Cat Island War Dog Reception and Training Center. Interpretation of the dog training facility may be added, including possibly wayside exhibits. Additional research would be conducted to document the cultural history of the island and to map existing cultural features.

Under this alternative, there would also be potential for scientific research on this unique barrier island. Cat Island is more easily accessed from the mainland, making such research more feasible. Additionally, human habitation of Cat Island would continue under this alternative, so the presence of researchers would align with management goals. A bunkhouse or other facilities to support research might be appropriate in the future.

Operations Support. A storage shed to assist with staging of materials and equipment would be provided on federal lands.

West Ship Island

Access. Access to the island would continue by way of private watercraft or concession operated passenger ferry service from Gulfport and/or Biloxi, Mississippi. Access by water would continue to be permitted by private boat, with unrestricted landings along the Gulf of Mexico shoreline (except in designated swim areas).

The NPS docking facility would continue to provide for loading and unloading of passengers and materials for a concession-operated water transportation service and national seashore personnel. A lateral pier connected to the existing NPS docking facility would be provided to accommodate safe access for passengers on private watercraft. Long-term docking of private watercraft would not be permitted.

Visitor Opportunities. A number of visitor facilities would continue to be provided, including comfort stations, a concession facility, and picnic/shade shelters.

Guided and self-guided interpretive tours would continue in Fort Massachusetts. The North Guard Rooms would continue to provide for a sheltered visitor contact area and accommodate Eastern National operations. The South Guard room would continue to be used for showing orientation film. Additional outdoor guided interpretive tours and educational programs would be provided in other areas of the island. Interpretive waysides and a kiosk would continue to provide self-guided opportunities for interpretation and orientation.

To enhance visitor understanding of the role Fort Massachusetts played in our country's history, certain portions of the fort might be restored to reflect its historic operational appearance. Cannon firing demonstrations might be introduced that would require the purchase of reproduction cannon and carriage.

Resource Management. Natural resource management efforts would continue to emphasize inventory, monitoring, and trend analysis of nesting shorebirds, sea turtles, and raptors, and establishment of closure areas around active nesting sites. Volunteer assistance in the sea turtle management program would continue to be limited because of the logistics of accessing the island.

The national seashore would continue to collaborate with the U.S. Army Corps of Engineers to help restore the island's sediment transport and budget system that was disrupted by previous and ongoing dredging of adjacent navigation channels.

Fort Massachusetts would continue to be protected and stabilized, including beach nourishment. It is the intent of the national seashore to continue sand replenishment activities in collaboration with the state of Mississippi and the U.S. Army Corps of Engineers. However, there may be conditions in the future that require other options for protecting Fort Massachusetts and nearby beaches.

In collaboration with other agencies and as funding allows, periodic mapping and monitoring of seagrass bed conditions would continue.

To minimize impacts on seagrass beds from vessel grounding, anchoring, and propeller scarring, a seagrass bed protection zone would be designated along the north shoreline.

Operations Support. Operations support facilities on the island would continue to be maintained, including staff residences, bunkhouse/first aid station, equipment shed, utilities, and communication service.

East Ship Island

Access. Access to the island would continue by way of private watercraft or commercial service. Unrestricted landings along the Gulf of Mexico shoreline would continue to be permitted.

Visitor Opportunities. The island would be managed as a primitive area. Visitors would have opportunities to experience an undeveloped barrier island, untrammeled by man, where solitude and the need to be self reliant provide inspiration and challenge. The primitive island environment would provide the senses with high quality scenic views, natural sounds, dark night skies, and natural scents. Opportunities for primitive overnight camping along the beach areas would continue. A permit system would be implemented requiring camping in designated areas. This would facilitate monitoring of visitor use and its effect on island resources. Depending on future use levels, the permit system might be extended to day users (including off-shore anchoring or mooring) to protect island resources.

On-site visitor services and facilities would not be provided. Davis Bayou Visitor Center would continue as the main source of

information to and interpretation of East Ship Island's history and resources.

Resource Management. Natural resource management efforts would continue to emphasize inventory, monitoring, and trend analysis of nesting shorebirds, sea turtles, and raptors, and establishment of closure areas around active nesting sites. Volunteer assistance in the sea turtle management program would continue to be limited in this area because of logistics.

The national seashore would continue to collaborate with the U. S. Army Corps of Engineers to help restore the island's sediment transport and budget system that was disrupted by previous and ongoing dredging of adjacent navigation channels.

To minimize damage to seagrass beds from vessel grounding, anchoring, and propeller scarring, a seagrass bed protection zone would be designated along the north shoreline of NPS lands on the island.

Plans to provide beach replenishment adjacent to the French Warehouse archeological site are being developed through Mississippi Coastal Improvement Plan. Additional study to document this at-risk site would be initiated.

Operations Support. No on-site operations support facilities would be provided. Staff would need to respond to management issues via West Ship Island, Horn Island, or from Davis Bayou.

Horn and Petit Bois Islands (Designated Wilderness)

Access. Access to the islands would continue by way of private watercraft or commercial service. Unrestricted landings along the Gulf of Mexico shoreline would continue to be permitted. The existing NPS docking facility on Horn Island would continue to be used for administrative purposes.

Horn Island is divided by private property. Under this alternative, the national seashore would work to acquire legal access such as an easement or land acquisition across this private parcel to provide legal access for visitors.

Visitor Opportunities. Visitors would have opportunities to experience a barrier island wilderness, untrammeled by man, where solitude and the need to be self reliant provide inspiration and challenge. The primitive island environment would provide the senses with high quality scenic views, natural sounds, dark night skies, and natural scents. Visitor services and facilities would continue to be limited, with only the island cross-over trail maintained. Opportunities for primitive overnight camping along the beach areas of the island wilderness would continue. A permit system would be implemented requiring camping in designated areas. This would facilitate monitoring of visitor use and its effect on island resources. Depending on future use levels, the permit system might be extended to day users (including off-shore anchoring or mooring) to protect island wilderness characteristics.

The Davis Bayou Visitor Center would continue to provide interpretation of Horn and Petit Bois Islands' history and resources, as well as education on wilderness values, appropriate uses, and potential hazards. An interpretive wayside and/or kiosk would be added within Horn Island's administrative enclave area to provide visitors with on-site information regarding the wilderness values, appropriate uses, and potential hazards.

Resource Management. Natural resource management efforts would continue to emphasize inventory, monitoring, and trend analysis of nesting shorebirds, sea turtles, and raptors, and establishment of closure areas around active nesting sites. Volunteer assistance in the sea turtle management program would be limited in this area because of logistics.

The national seashore would continue to collaborate with the U. S. Army Corps of

Engineers to help restore the island's sediment transport and budget system that was disrupted by previous and ongoing dredging of adjacent navigation channels.

The national seashore staff would continue to coordinate with the U.S. Department of Agriculture to eradicate the exotic cactus moth from the island.

To minimize damage to seagrass beds from vessel grounding, anchoring, and propeller scarring, a seagrass bed protection zone would be designated along the north shoreline of NPS lands of the island.

Within the administrative enclave area on Horn Island, the use of the tractor trail between the dock and administrative area would be discontinued.

Operations Support. No on-site operations support facilities would be provided on Petit Bois Island. Staff would need to respond to management issues via West Ship Island, Horn Island, or from Davis Bayou.

On Horn Island, a small operations support center would continue to be maintained within the administrative enclave area including ranger residences, bunk, and office complex, and a dock.

If facilities were destroyed by a storm, management would reassess the need to maintain an on-site NPS presence and facilities.

STAFFING AND COSTS

The staffing level under alternative 3 would be 105.5 full-time equivalent (FTE) staffing positions. Currently, the national seashore is authorized to have 111 FTE and therefore, this alternative would not require additional staffing beyond the authorized amount. Instead, the 19.5 FTE employees above the current level would support resource stewardship and visitor services envisioned under this alternative. The breakdown of additional staffing needs by each management division is presented below.

The Superintendent's Office and Administrative Division would seek an increase in 2 full-time-equivalent employees, bringing their division's total to 12 full-time-equivalent employees to manage an expanded commercial services program, manage an expanded partnership program, and provide IT (information technology) support for both districts.

The Resource and Visitor Protection Division would seek an additional 3.5 full-time-equivalent employees bringing their division's total to 34.5 full-time-equivalent employees to support an increase in patrols within the marine environment, increase patrols on Cat Island, and implement the camping permit system.

The Interpretive Division would seek an additional 5 full-time-equivalent employees bringing their division's total to 15 full-time-equivalent employees to support expanded interpretive and educational programs; provide staffing at visitor contact stations at the Fort Pickens Ranger Station; to initiate the mobile interpretive van service to Perdido Key, Okaloosa, and Santa Rosa; and to support the education and research centers at Fort Pickens, Naval Live Oaks and Davis Bayou, and possibly a visitor contact at the Pensacola Lighthouse complex.

The Science and Resources Management Division would seek an increase of 6 full-time-equivalent employees bringing their division's total to 15 full-time-equivalent employees to establish resource management programs for the marine environment and cultural resources, initiate resource inventory and monitoring efforts for Cat Island and on Eglin Air Force Base managed lands within the national seashore, support expanded research programs coordinated through partnerships, and possibly initiate cultural resource stabilization and rehabilitation efforts for the Pensacola Lighthouse complex.

The Facility Management Division would seek an additional 3 full-time-equivalent employees, bringing their division's total to 29 full-time equivalent employees to proactively

manage the deferred maintenance program, support new maintenance responsibilities at Fort Pickens, Naval Live Oaks, Perdido Key, and Cat Island and possibly the Pensacola Lighthouse complex; and to maintain an expanded fleet of marine vessels needed for enhanced resource management and protection efforts.

Volunteers and partnerships would continue to be key contributors to NPS operations.

The cost estimates provided here are given for comparison to other alternatives only; they are not to be used for budgeting purposes. Although the numbers appear to be absolutes, they represent a midpoint in a possible range of costs. The total one-time cost for new facilities under this alternative is estimated at $9,500,000. Annual operating costs under this alternative would be $8,940,000. Presentation of these costs in this plan does not guarantee future NPS funding. Project funding would not come all at once; it would likely take many years to secure and may be provided by partners, donations or other nonfederal sources. Although the national seashore hopes to secure this funding and would prepare itself accordingly, the national seashore may not receive enough funding to achieve all desired conditions within the timeframe of the *General Management Plan* (the next 20 or more years).

ALTERNATIVE 4

CONCEPT

The National Park Service would seek to collaborate and expand partnerships with educational and cultural institutions, nonprofit organizations, and commercial service providers to promote a greater array of national seashore recreational and educational opportunities among a variety of coastal settings.

Visitor Experience

Similar to alternative 1, the national seashore would continue to include opportunities for beach activities, boating, fishing, camping, picnicking, biking, motor touring, backcountry use, exploration of coastal fortifications, and other uses compatible with the protection of the national seashore's scenic, natural, and cultural values. These opportunities would range from recreating with large groups within developed to semi-developed areas to finding solitude within an undeveloped wilderness island setting.

However, under this alternative greater emphasis would be placed on expanding and diversifying the range of outdoor recreational opportunities available among a variety of coastal settings. Selected sites could include areas that accommodate a high level of visitor use while providing for a diversity of visitor opportunities. In some cases expanded commercial services could provide recreational equipment rentals, water-based transportation, and food service.

Similar to alternative 1, the interpretive program would continue to foster public awareness and appreciation of the fundamental resources and values of the national seashore. Greater emphasis would be placed on using the national seashore as an outdoor classroom to provide visitors with on-site opportunities to explore and learn about the northern Gulf Coast ecology and human history while also continuing to provide recreational opportunities.

History would be brought to life at selected coastal fortifications by actively presenting stories of important periods of their history. By furnishing these forts with historic or reproduction cannon and other objects, visitors would be able to visualize and learn about the role of coastal defense to protect mainland communities.

Visitors would be provided opportunities for guided and self-guided opportunities to explore coastal ecology and the natural settings that illustrate how barrier islands provide protection to the mainland coastline from the effects of major storms.

NPS programs could include opportunities for visitors to observe preservation activities including stabilization and data collection.

Under this alternative the national seashore would collaborate with educational and cultural institutions, nonprofit organizations, and commercial services to provide visitors with a greater range of seashore opportunities. Potential examples of this partnership could include guided educational programs and other collaborations that enhance visitor opportunities while protecting the valuable resources of the national seashore. As part of the marine resource management plan, opportunities for enhanced scuba diving and snorkeling, including environmental education, would be considered.

The national seashore would collaborate with and support regional educational and research programs focusing on preservation and understanding of the natural and cultural environment of the northern Gulf Coast.

Provisions to ensure safe visitor use and enjoyment would include providing lifeguard personnel at designated swim beach areas and law enforcement patrols with search and

rescue capabilities. Educational information would also be provided on the hazards of recreating in the natural environment and exploring historic structures.

Natural Resource Conditions

Natural resources would be managed to provide a variety of settings that support access and opportunities for visitors. More intervention and management techniques might be required to provide such opportunities while also protecting the natural environment to the greatest extent possible. In nonsensitive areas, natural resources could be modified to provide and accommodate a range of recreational activities, visitor services, and interpretive/educational programs. Exceptional and critical ecosystems, habitats, and processes would be monitored to identify emerging impacts created by human activities that require corrective management response.

Natural resources would be managed to preserve the integrity of the national seashore's fundamental terrestrial, estuarine, and marine ecological resources while ensuring that visitors have access to an expanded range of recreational and educational opportunities within a wide variety of coastal settings. Exceptional and critical natural resources and processes would continue to be managed to preserve their intrinsic values. These areas would continue to be inventoried, evaluated, monitored, protected, and preserved in accordance with NPS policies and legislative and executive requirements. Strategies would continue to be developed to protect resources and conduct data collection where threats have been identified. Restoration efforts would focus on reestablishing natural resource conditions that have been altered or impacted by human activity; however, natural resource manipulations would continue in areas surrounding coastal fortifications to ensure protection from threats to their stability and integrity posed by continuing shoreline changes.

In addition to this baseline natural resource management approach, under this alternative natural resources could be modified to restore cultural landscape characteristics of coastal fortifications or the Naval Live Oaks Area to enhance educational and interpretive opportunities for these specific resources.

In locations where natural resources are more resilient to human impacts and visitation, these sites could be modified or developed to provide greater access and capacity for an expanded and assorted range of new recreational opportunities.

Cultural Resource Conditions

Where their historic integrity would not be compromised, the masonry forts, artillery batteries, and their associated structures would be adaptively used to support a diverse range of recreational, interpretive, and educational opportunities. An evaluation of the potential to restore historic forts, artillery batteries, and associated structures to portray their appearance/function during a specific operational period(s) to enhance interpretive/educational opportunities would be conducted.

All accessioned museum objects pertinent to the national seashore, except for archeological artifacts stored at the NPS Southeast Archeological Center in Tallahassee, Florida, would be consolidated in one multi-park and jointly administered facility as identified in the 2006 NPS Southeast Region Collections Management Plan. This consolidation of museum objects includes the national seashore's natural history collections as well.

In addition under this alternative, historic structures lacking potential for restoration to a specific operational period would be evaluated for their potential to be rehabilitated to serve contemporary uses. Adaptive reuse would be consistent with the historic structures's integrity and character and support enhanced visitor services and/or accommodate administrative needs.

Archeological sites listed or eligible for inclusion in the National Register of Historic

Properties could be used for interpretive and educational purposes. Museum objects specifically related to the national seashore could be used to support and broaden educational/interpretive displays.

Similar to alternative 1 and as funding permits, the national seashore staff would continue to inventory areas that have not yet been documented. These resources would be evaluated, monitored, and protected in accordance with the NPS historic preservation policies and legislative and executive requirements.

Strategies would continue to be developed to stabilize resources or conduct data collection where threats have been identified.

AREA-SPECIFIC MANAGEMENT ACTIONS—FLORIDA UNITS

Naval Live Oaks Area

Access. Similar to alternatives 1 through 3, access by land would continue via U.S. Highway 98. The national seashore would continue to coordinate with local and state officials to improve safe highway access to and from U.S. 98 and national seashore developed areas. The existing bicycle/pedestrian trail connection along the south side of U.S. 98 would continue to provide visitors with an alternative means of accessing the Naval Live Oaks Area.

Access by water would continue to be permitted by private boat; however, under this alternative, options for boat landings along the Pensacola Bay and Santa Rosa Sound shorelines may be restricted to designated areas (see resource management section that follows). In addition, to encourage safe public access by water, a dock facility (no ramp) might be provided on the Santa Rosa Sound side near the visitor center as well as a formalized canoe/kayak/small boat landing.

Visitor Opportunities. Similar to alternatives 1 through 3, visitor orientation/interpretation and Eastern National bookstore would continue to be provided at the Naval Live Oaks Visitor Center. The interpretive nature trails to areas of special interest on both the north and south sides of U.S. Highway 98 would also be continued.

After a cultural landscape report is completed, a small portion of the historic live oak plantation (< 5 acres) might be managed to reflect historic plantation conditions for interpretive/educational purposes.

Some area trails might be formalized with permeable paved surfaces to contain resource damage from heavy use. Expanded trail opportunities might be provided using existing firebreaks.

Similar to alternative 1, this area would continue to provide for day use recreation, a formalized picnic area with comfort stations, primitive picnic and beach access area (with no restrooms or changing areas), and organized youth group camping. However, under this alternative the use of the youth group camping area would be expanded to allow any organized group or individual users.

Resource Management. Natural resource management efforts would continue to emphasize terrestrial vegetation and wildlife management, using prescribed fire to enhance wildlife habitat and reduce hazardous fuels. Monitoring efforts would continue to assess trends in the resident gopher tortoise population. Similar to alternatives 2 and 3, to minimize damage to seagrass beds from vessel grounding, anchoring, and propeller scarring, a seagrass bed protection zone would be designated along the north shoreline of NPS lands extending into Santa Rosa and Pensacola Bay.

Parking areas would not be expanded, although the paving would be replaced with permeable surfacing to promote stormwater infiltration into the soil and reduced stormwater runoff.

Cultural resource management efforts would continue to be supported by the NPS Southeast Archeological Center, who periodically provide monitoring and assessment of archeological resources conditions.

Operations Support. Similar to alternative 1, the visitor center/headquarters complex at Naval Live Oaks would continue to be the main administrative office space for national seashore staff. In addition, a new maintenance facility would be constructed in the existing fenced area of the north maintenance compound to consolidate Florida District maintenance operations. Dedicated space for resource management support, including a fire cache, would also be accommodated in the new facility. This alternative would be consistute a lower cost in the long-run than the trailers that are currently used at the maintenance area, because long-term total costs for trailers are higher than construction of a sustainable, appropriately designed facility.

The utility service would be upgraded as needed to accommodate the new complex. All utilities would be consolidated within one corridor.

Pensacola Naval Air Station Historic Sites

Access. Similar to alternatives 1 through 3, access by land would continues using the main entrance to the Pensacola Naval Air Station via Florida State Highway 292 and going 1 mile south on Florida State Highway 295. Depending on national security level alerts, public access into Naval Air Station grounds might be restricted. An evaluation of the feasibility to implement a land-based shuttle service between Fort Barrancas and the Pensacola Naval Air Station Museum as well as other potential points of interests such as the Pensacola Lighthouse complex and the Advanced Redoubt would be initiated in consultation with Naval Air Station command. Shuttle service by commercial service would also be explored with Pensacola Naval Air Station and the city of Pensacola.

Visitor Opportunities. Similar to alternatives 1 through 3, the contemporary visitor center and bookstore would continue to provide orientation to and overall interpretation of the historic sites in the Pensacola Naval Air Station. Fort Barrancas, Bateria de San Antonio (Water Battery), and Advanced Redoubt would continue to be available for visitor exploration. In addition, under this alternative, if management of the Pensacola Lighthouse complex were transferred to the National Park Service, provision for exterior interpretation of the complex would be programmed. The keeper's quarters would be adaptively rehabilitated for use as a visitor contact station and bookstore, with possible visitor access into the lighthouse interior.

After completion of a cultural landscape report, historic sites in this area would be managed as cultural landscapes. Selected features would be possibly restored to portray their appearance/function during specific historic operational periods for interpretive/educational purposes. Additional interpretive exhibits would be programmed.

The Trench Trail connecting Fort Barrancas and the Advanced Redoubt and the Woodland Nature Trail would continue to provide visitors an opportunity to explore the historic grounds by foot. Opportunities to provide a trail connection between Fort Barrancas and the Pensacola Lighthouse complex would be explored in consultation with Naval Air Station command. Picnic facilities would continue to be provided near Fort Barrancas and the Advanced Redoubt.

Resource Management. Cultural resource management efforts would continue to emphasize ongoing stabilization efforts to preserve Fort Barrancas, Bateria de San Antonio (Water Battery), and Advanced Redoubt. Because Fort Barrancas is a National Historic Landmark, the highest historical designation a structure can be given, it would be afforded special protection and impacts would be minimized. If the management of the Pensacola Lighthouse were transferred to the National Park Service, stabilization and rehabilitation efforts would be assessed, programmed, and initiated.

The national seashore would enhance their coordination efforts with the command of the Naval Air Station to maintain the historic viewshed of Fort Pickens, Pensacola Pass, and Fort McRee areas.

Operations Support. Staff office space would continue to be provided in the Fort Barrancas Visitor Center. Additional staff office space might be provided in the keeper's quarters in the Pensacola Lighthouse complex.

Perdido Key Area

Access. Similar to alternative 1, access by land would continue from Florida State Highway 292. Johnson Beach Road would continue to provide for road shoulder parking with designated dune crossovers providing multiple access points to the beach along the Gulf of Mexico and the lagoon side. The road would continue to extend 2.4 miles east with a turnaround drop-off area at the terminus. The last 0.5 mile would remain closed to parking.

A multiuse path would be connected to the county walkway at the national seashore boundary extending to Johnson Beach (0.5 mile).

Access by water would continue to be permitted by private boat, with unrestricted landings along the Gulf of Mexico shoreline (except in designated swim areas).

Visitor Opportunities. A recreation area would continue to be provided at Johnson Beach, with restrooms, parking, covered picnic facilities, and swim beach with lifeguard, as well as the small boat launch area and parking for canoe, kayak, and other small boat use on the lagoon side just north of the beach.

Interpretive opportunities would be expanded throughout the area including interpreting the history of Rosamond Johnson Beach and maintaining the Discovery Trail on the north side of Perdido Key. The Rosamond Johnson Beach was a segregated beach in the mid-1900s, and this history would be interpreted for visitors. Expanded interpretive/educational opportunities could be provided under this alternative, such as constructing a new seasonal visitor orientation/contact station and bookstore, establishing interpretive canoe and kayak trails within Big Lagoon, providing regularly scheduled curriculum-based school programs in the area, and providing on-site interpretive programs at Fort McRee and by way of interpretive boat tours. Additional educational opportunities would be introduced by way of a mobile interpretive/educational vehicle.

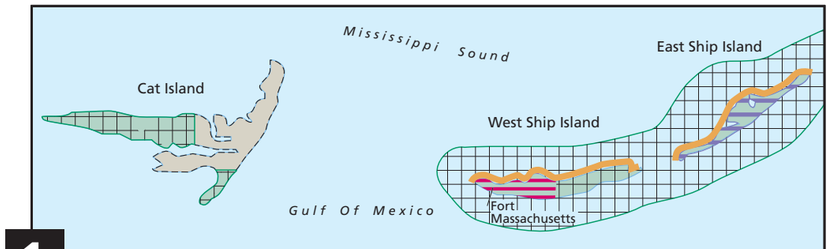
To enhance access and expand recreational opportunities within the area, the feasibility to commercially provide recreational equipment rental services (i.e., umbrellas, surf boards, canoe, kayak, bicycle, etc.) would be evaluated. The staging of this activity would be in the Johnson Beach area.

To minimize impacts on the environment and to provide for enhanced service for recreational users, additional restroom facilities (composting or vault toilets) would be provided at existing dune crossovers along Johnson Beach Road and within the eastern tip area of the key.

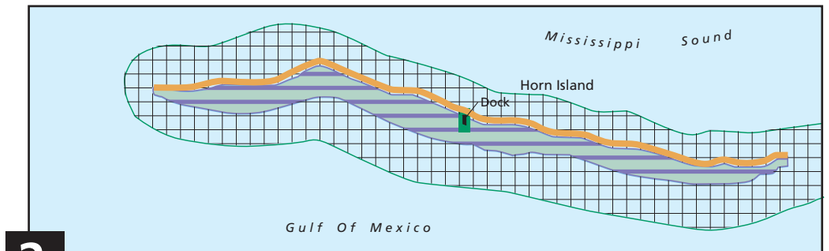
Options would be explored to rehabilitate the historic batteries to provide shelter for recreational users.

Primitive camping would continue to be allowed 0.5 mile beyond the end of the road, although a permit system might be established for all overnight camping (land based and overnight mooring of boats).

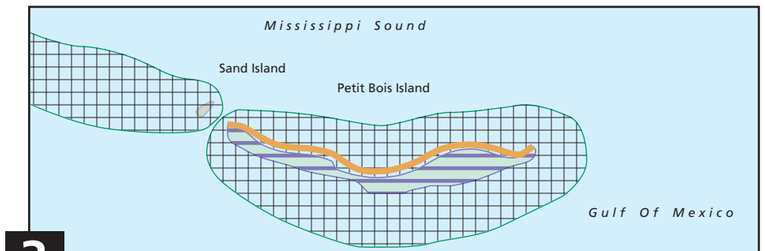
Resource Management. Natural resource management efforts would continue to emphasize inventory, monitoring, and trend analysis of nesting shorebirds and sea turtles from mid-March through September. Volunteer efforts would continue to extend the reach of existing staff in accomplishing this effort.



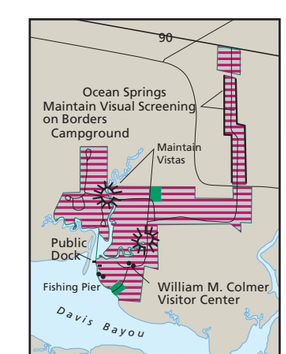
1 Cat Island, West Ship Island, East Ship Island



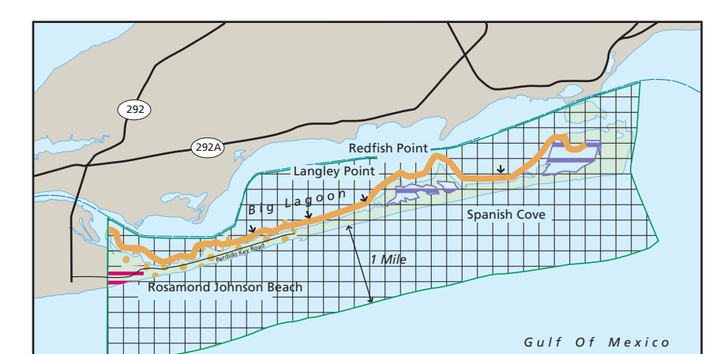
2 Horn Island



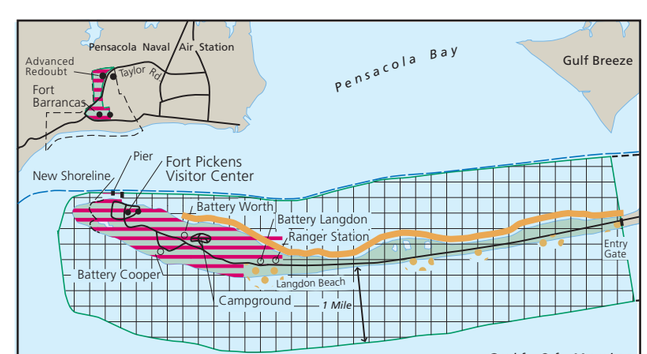
3 Petit Bois Island



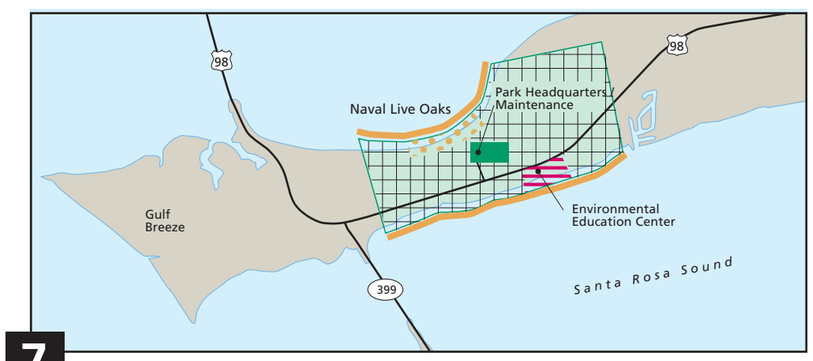
4 Davis Bayou



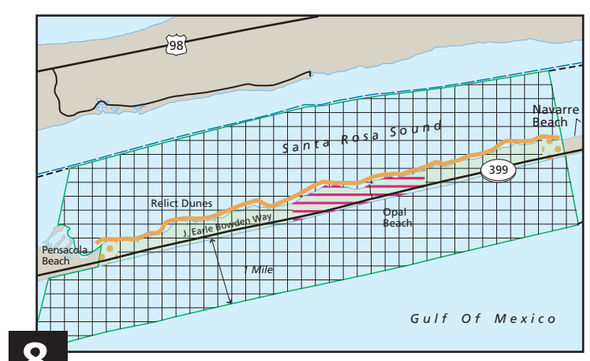
5 Perdido Key



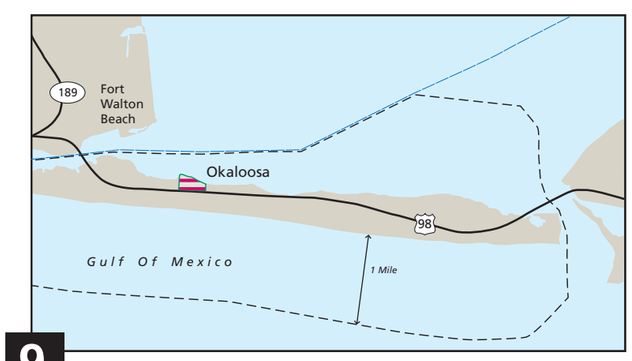
6 Fort Pickens / Fort Barrancas



7 Naval Live Oaks



8 Santa Rosa Area



9 Okaloosa

Intracoastal Waterway

Administrative Boundary

Legislative Boundary

Non NPS Lands

NPS Lands

ZONES

Natural Settings With Dispersed Recreation

Diverse Visitor Opportunities

Recreational Beaches

Resources Management and Science Priority

Non-motorized Primitive Visitor Opportunities

National Seashore Operations

Seagrass Bed Protection

Gulf Islands National Seashore Map Key

North

Not to scale

ALTERNATIVE 4

Gulf Islands National Seashore

Mississippi • Florida

National Park Service / U.S. Department of the Interior

The national seashore staff would continue to collaborate with the U.S. Fish and Wildlife Service in assessing the conditions of the resident Perdido Key beach mouse populations.

To minimize damage to seagrass beds from vessel grounding, anchoring, and propeller scarring, a seagrass bed protection zone would be designated along the north shoreline of NPS lands on Perdido Key.

Cultural resource management efforts would continue to emphasize ongoing stabilization efforts to preserve the remnant batteries and seawall of Fort McRee.

Operations Support. The ranger station, entrance station, maintenance shop, and trailer pad for volunteer housing would continue to be maintained.

Fort Pickens Area

Access. Fort Pickens Road would continue to provide vehicular access between Pensacola Beach and the Fort Pickens Area. The intent of the national seashore is to reconstruct the road after major storms. The national seashore's hurricane recovery plan would include a provision to procure and deploy, if feasible, temporary surfacing to accommodate administrative vehicular and public foot/bike access to the Fort Pickens Area until road repairs could be completed after major storms.

Two small beach access areas with parking would continue to be provided and possibly expanded along Fort Pickens Road. Bike and pedestrian access would continue to be permitted along the road shoulders. Other designated bike trail opportunities would continue between the campground and Fort Pickens. The route could also be made available for a shuttle system or trolley service, if such a system were found to be feasible in the future.

Access by water would continue to be permitted by private boat, with unrestricted landings along the Gulf of Mexico shoreline (except in designated swim areas).

To enhance visitor access by water, a new passenger ferry pier will be constructed to accommodate commercial water-based transportation service and NPS administrative use. Planning for this pier is currently underway (via the Fort Pickens Ferry Pier Environmental Assessment and public process). If feasible, the pier may provide private boaters a safer opportunity to load and unload passengers. Land-based connections to the ferry pier and other ground transportation options in the Fort Pickens area would be explored.

The feasibility to initiate/expand commercial passenger ferry service or other water-based transportation service to the Pensacola Naval Air Station and Naval Live Oaks from the Fort Pickens Area would be evaluated.

Visitor Opportunities. Historic structures in Fort Pickens would continue to be used to support visitor services. This would include the Fort Pickens visitor center and bookstore; Battery Cooper and Worth for interpretive programs; the firehouse for concession food service and adjacent public restrooms; the mining casemate for public restrooms, library, Eastern National office and storage; and Building 5 for auditorium, museum, and staff offices. Other portions of the district might be rehabilitated to portray their historic appearance and function with incorporated interpretive media to enhance visitor understanding. If funded and supported through partnership efforts, other areas could be adaptively rehabilitated to accommodate a shared educational and research facility.

The downstairs interior of the Fort Pickens Ranger Station might be rehabilitated to portray its historic appearance/function with incorporated interpretive media to enhance visitor understanding of the Lifesaving Service.

Concession services would be expanded to include recreational equipment rental (bikes, approved alternative power driving mobility

devices, electric carts, etc.) to enhance access in the national historic district. The feasibility of providing a seasonal shuttle service throughout the area would be evaluated.

Contemporary structures would continue to be used for visitor services, such as the entrance station, the jetties restroom (near fishing pier), Battery Worth picnic shelter and restroom, and Little Langdon picnic shelter and restroom.

The swim beach recreation area at Langdon Beach would continue to be provided with lifeguard services, a picnic shelter, restroom/ changing rooms, and outdoor showers. An additional swim beach area would be provided 0.25 mile beyond the east boundary at Pensacola Beach.

The contemporary campground would continue to be maintained with individual and group sites, restrooms, dump station, and electrical hookups. A "tent camping only" zone would be designated in Loop A to separate RV camping from tent camping. The campground would be expanded to include walk-in tent campsites for ferry passengers, hikers, boaters, and bicycle riders. The Campground Store would be removed. The feasibility of adapting one of the historic structures (Battery Worth, Langdon, or other) to accommodate camper registration and store functions would be evaluated. If not feasible, new structure would be constructed as described in alternative 3. Additional parking and circulation improvements would be provided to accommodate additional functions. The feasibility of converting campground operation into a concession operated service would be evaluated.

Contemporary amphitheater structure would continue to be provided for interpretive and educational programs.

Fishing and sightseeing opportunities would continue to be provided at the fishing pier.

Interpretive trails, including the Blackbird Marsh Trail, Dune Nature Trail, Fort Pickens Self Guided Tour Trail, and cross-over trail, would continue to be provided. Additional boardwalk beach crossovers would be provided as needed to minimize resource damage, such as near Battery 234 (lookout tower) and batteries Cooper and Payne. NPS staff would continue to support the Florida National Scenic Trail and terminus in the Fort Pickens Area.

Resource Management. Natural resource management efforts would continue to emphasize inventory, monitoring, and trend analysis of nesting shorebirds and sea turtles from mid-March through September. Volunteer efforts would continue to extend the reach of existing staff in accomplishing this effort.

To minimize damage to seagrass beds from vessel groundings, anchoring, and propeller scarring, a seagrass bed protection zone would be designated along the north shoreline area between Battery Worth and Pensacola Beach.

Cultural resource management efforts would continue to emphasize ongoing stabilization efforts to preserve historic structures in Fort Pickens as well as the structures associated with the Fort Pickens Ranger Station.

Operations Support. Historic structures in Fort Pickens would continue to be used to support Florida District operations and NPS housing. The use of other historic structures would be considered for expanded housing opportunities.

With the conversion of the Fort Pickens Ranger Station for visitor use, the ranger station, resource and visitor protection and science and resources management district office space would be relocated into other historic structures in the Fort Pickens Area. The campground registration function would be relocated to the Campground Store.

A majority of the district maintenance functions would be relocated into a new maintenance complex constructed in the Naval Live Oaks north compound area. A limited maintenance staging presence with a couple of

historic structures would be maintained to accommodate limited storage and shop space.

Contemporary structures that include the chlorinator building and well head building would continue to be maintained to support the area's water system. Use of the carpenter shop would be discontinued, and the structure would be removed.
Utility services (telephone, power and sanitation) would continue to be provided. The on-site wells and water distribution system would continue to be maintained. The two above ground fuel tanks would continue to service vessels and equipment. The feasibility of wireless telephone and underwater electrical service would be assessed.

Santa Rosa Area

Access. J. Earle Bowden Way, SR 399 (7 miles) would continue to be maintained as a two-way vehicular public access road and evacuation route between Pensacola Beach and Navarre Beach. Parking would only be allowed in designated areas, and parking on road shoulders would continue to be prohibited. Bike and pedestrian access would continue to be allowed along the road shoulders. Three beach access areas with dune crossovers would continue to be provided. The route could also be made available for a shuttle system or trolley service with additional turnouts that provide shelters, restrooms, and dune crossovers, if such a system were found to be feasible in the future.

Access by water would continue to be permitted by private boat, with unrestricted landings along the Gulf of Mexico shoreline (except in designated swim areas).

Visitor Opportunities. The swim beach recreation area at Opal Beach would continue to be provided. However, if structures are destroyed by a storm, best available technology and design will be considered when deciding what type of facility and what materials will be chosen to replace the structure. The capacity at Opal Beach would be expanded, and/or additional swim beach areas would be provided at the west and east ends of the area.

A permit system for primitive camping in designated areas would be implemented. NPS staff would coordinate with regional efforts to establish a canoe route from Perdido Key River running eastward.

NPS staff would continue to support the routing of the Florida National Scenic Trail through the area. Seasonal restrictions on recreation along the route might be applied during critical nesting periods for shorebirds and turtles.

To enhance access and to expand recreational opportunities within the area, the feasibility of commercially providing recreational equipment rental services (i.e., canoe, kayak, bicycle, etc.) would be evaluated.

Wayside exhibits would be maintained, as would on-site, scheduled, interpretive programs. Additional educational opportunities would be introduced by way of a mobile interpretive/educational vehicle. Wayside exhibits would be provided at new swim beach areas.

Resource Management. Natural resource management efforts would continue to emphasize inventory, monitoring, and trend analysis of nesting shorebirds and sea turtles from mid-March through September. Volunteer efforts would continue to extend the reach of existing staff in accomplishing this effort.

To minimize impacts on seagrass beds from vessel grounding, anchoring, and propeller scarring, a seagrass bed protection zone along the north shoreline would be designated.

Operations Support. Operational support structures, entrance station, maintenance/ranger station, lifeguard station, emergency medical services, office space, and storage would be maintained in the Opal Beach day use area. If structures are destroyed by a

storm, best available technology and design will be considered when deciding what type of facility and what materials will be chosen to replace the structure.

Utility service would continue to be provided to Opal Beach, and the new eastern beach access area would tie into this service. The feasibility of extending Navarre Service to the new western beach access area or tying into Pensacola municipal utility service would be evaluated.

Okaloosa Area

Access. Vehicular access to the Okaloosa Area would be accommodated by U.S. Highway 98. Boat access to the Santa Rosa Sound would continue to be accommodated by an existing small boat launch ramp and a trailer parking area. Under alternative 4, the launch ramp and parking area might be expanded to accommodate larger vessels and/or higher volume of smaller vessels.

Visitor Opportunities. The swim beach recreation area at Okaloosa Beach, which includes a picnic area, shelters, and restroom facilities with outdoor showers, would continue to be maintained. Lifeguard service would be provided for the first time at this area. To help offset the increase in operational costs, a fee collection area would be established. Separate bathing and recreational areas would be designated to minimize visitor use conflicts. The parking area might be expanded by up to 20%, as funding and space allow. Interpretive services would be enhanced, and a gateway presence to the national seashore would be established by providing a new visitor contact station on-site. Provisions for collecting fees would be accommodated in the structure. Commercial use authorizations would continue to be allowed for recreational instruction activities that are self-contained using mobile trailers, etc. Organized regatta events would continue to be accommodated using nonmotorized vessels through special use permits. Additional educational opportunities would be introduced by way of a mobile interpretive/educational vehicle. Commercial services might be permitted to support on-site recreational activities.

Resource Management. Natural resource management efforts would continue to emphasize inventory, monitoring, and trend analysis of nesting shorebirds. The site, situated on the eastern end of the national seashore, would also serve as a barometer of potential threats from outside perturbations.

The national seashore staff would seek cooperation with the Eglin AFB commander, the state, and surrounding municipalities and counties in regard to inventories and monitoring of natural and cultural resources on lands within the national seashore boundary.

Operations Support. The volunteer trailer pad would continue to be maintained. The new contact station would also accommodate a new ranger station with administrative office space. Site utilities that are serviced by adjacent municipality would be maintained. High-speed Internet access would be provided to support interpretive programs and administrative needs.

AREA-SPECIFIC MANAGEMENT ACTIONS—MISSISSIPPI UNITS

Davis Bayou

Access. The 2.2-mile national seashore entrance road connecting to U.S. Highway 90 would continue to provide access to a number of recreational features within the Davis Bayou Area. Access would continue to be maintained to residential areas from the entrance road. Except for the VFW road, these roads would continue to dead-end in residential areas outside the national seashore requiring their access through the national seashore. Just before Gollott Road, the national seashore has established a road connection with the Gulf Coast Research Laboratory Cedar Point Facility. In the northwest section of the area, a fifth residential road, Robert McGhee Road, would remain gated and closed to auto traffic and would continue to be used as walk-in access

and part of the "Live Oak Bicycle Route" connecting Ocean Springs and Davis Bayou. It also would provide for an alternative emergency vehicle access way into and out of the area. To expand access and recreational opportunities, a multiuse trail would be added adjacent to existing roadways. Planning for this area would evaluate the possible closure of the VFW road to vehicular traffic to assure the safety of pedestrians and bicyclists. Water access for private boats to and from the Mississippi Sound would continue to be maintained by boat ramp. Additional water access for paddlers would also be accommodated at the existing boat launch facility. The public fishing pier at the visitor center would be adapted to also accommodate commercial water transportation service operators. Dredging and other navigational activities would be needed to support larger boats and increased use.

To enhance access and to expand recreational opportunities within the area, the feasibility of commercially providing recreational equipment rental services (i.e., canoe, kayak, bicycle, etc.) would be evaluated.

Visitor Opportunities. The Davis Bayou Visitor Center would continue to be the national seashore's Mississippi hub for providing visitors with orientation, information, interpretive exhibits, and book sales. Indoor and outdoor interpretive and educational programs would continue to be provided at the visitor center and the campground amphitheater. To accommodate larger groups and expanded interpretive programs, a new amphitheater pavilion might be constructed in the vicinity of the Davis Bayou Visitor Center.

Water- and land-based visitor opportunities for exploration and learning about the Davis Bayou ecosystem would be provided through guided and self-guided interpretive nature trails and guided boat interpretive tours. The old well shed would be expanded/ adapted to accommodate an environmental learning classroom area. The scenic viewshed around Davis Bayou would be maintained.

NPS staff would continue to partner with University of Southern Mississippi Cedar Point's Gulf Coast Research Laboratory on their plans for a new visitor center on aqua culture and possibly a new marine education center that could be built there. Partnerships with additional universities would support a shared educational and research facilities. The consortium would fund and manage a facility based at or near Davis Bayou.

A collaboration of academia, scientists, public agencies, and other conservation organizations would be pursued to enhance opportunities for research and education.

Camping opportunities with access to power and water service hookups would continue to be provided. A "tent camping only" zone would be designated in the existing campground footprint (perhaps in the lower loop area) to separate trailer camping from tent camping.

The open space near the Davis Bayou campground area would be used for outdoor environmental education and/or restored to a more natural environment. Picnic opportunities would continue to be provided.

Accessible fishing opportunities would be expanded by extending the public fishing pier. Commercial fishing guide service would continue to be permitted through commercial use authorizations.

A bluewater trail with markers in the Davis Bayou Area would be developed, with possible connections to Cedar Point and USFWS Sandhill Crane Refuge near the Ocean Springs Airport.

Resource Management. Natural resource management efforts would continue to emphasize terrestrial vegetation and wildlife management, using prescribed fire to enhance wildlife habitat and reduce hazardous fuels. Methods for restoring the wetland prairie ecosystems would continue to be tested while maintaining adequate screening of adjacent neighborhoods. In partnership with the Gulf

Coast Research Laboratory, the bayou and wetland systems would continue to be monitored and conditions would be assessed.

The effects of the existing culverts under the Davis Bayou road on the bayou system could be investigated during a hydrologic study. Culvert systems might be redesigned as needed to restore natural surface, tidal, and storm flows throughout the bayou system. Restoration efforts might include those to reverse the effects of mosquito ditching near Marsh Point.

Cultural resource management efforts would continue to emphasize ongoing stabilization efforts for the CCC cabins. Dedicated space in the visitor center would continue as an archival repository for specimens and objects collected in the Mississippi District.

Operations Support. The Davis Bayou Visitor Center would continue to provide administrative support space for Mississippi District staff. If additional space was needed to support expanded administrative functional needs, this would be accommodated in a leased or new structure in another existing or previously developed area.

The Davis Bayou Area would continue to provide for district maintenance staging for office, shop, and storage space. If additional space was needed to support any expanded maintenance function needs, this would be accommodated in the maintenance compound.

NPS housing would continue to be provided for seasonal staff, youth interns, and other partners.

The NPS marina area would be maintained to support administrative access to Mississippi island areas.

Utility service would continue to be provided from Ocean Springs.

Cat Island

Access. Access to the island would continue by way of private watercraft or limited commercial service. Unrestricted watercraft landings along the Gulf of Mexico shoreline would continue to be permitted, however landing locations on the Mississippi Sound side might be restricted to designated areas. A new NPS docking facility would be established on federal lands to provide for administrative and commercial water transportation service.

Visitor Opportunities. Visitors would have opportunities to explore areas of the island that are under federal ownership. Private lands would continue to be restricted from visitor use. Opportunities for primitive overnight camping would continue, although a permit system would be implemented requiring camping in designated areas. This would facilitate monitoring of visitor use and its effect on island resources. Upon completion of land acquisition, a group campsite (with backcountry-type toilet facility) would be provided. Depending on future use levels the permit system might be extended to day users (including off-shore anchoring or mooring) to protect island resources. The national seashore staff would also establish a hiking trail system throughout federal lands of the island using portions of the existing road network.

To enhance access and to expand recreational opportunities in the marine environment, the feasibility of commercially providing recreational equipment rental service (canoe, kayak, etc.) bundled with commercial service would be evaluated.

The Davis Bayou Visitor Center would continue as the main source of information and interpretation of Cat Island's history and resources. Interpretive waysides at points of interest and a small classroom with laboratory space to enhance educational opportunities would be provided on federal lands. Guided interpretive tours and educational programs might also be provided.

Resource Management. The site, situated on the western end of the national seashore, would continue to serve as a barometer of potential threats from outside disturbances.

Natural resource inventories would be initiated for federal lands on the island. The national seashore staff would coordinate with the Mississippi Department of Marine Resources and private landowners to establish strategies for minimizing impacts on seagrass beds. The national seashore would identify shoreline landing locations on federal lands to aid in this effort.

Upon completion of land acquisition, portions of the road and canal networks on federal lands that are no longer needed to provide visitor and/or private landowner access would be restored to natural conditions.

A partnership science and research program would be developed and supported by a small research facility.

Cultural resource management efforts would continue to emphasize stabilization of the remnant features of the World War II Cat Island War Dog Reception and Training Center.

Additional research would be conducted to document the cultural history of the island and to map existing cultural features.

Under this alternative, there would be potential for scientific research on this unique barrier island. Cat Island is more easily accessed from the mainland, making such research more feasible. Additionally, human habitation of Cat Island continues under this alternative, so the presence of researchers would align with management goals. A bunkhouse or other facilities to support research might be appropriate in the future.

Operations Support. A small storage shed to assist with staging of materials and equipment would be provided on federal lands. Upon completion of land acquisition, a vandal-resistant office/bunk house structure supported by a sustainable (green) site utility system would be provided for transient staff and cooperators.

West Ship Island

Access. Access to the island would continue by way of private watercraft or concession operated passenger ferry service from Gulfport and/or Biloxi, Mississippi. Access by water would continue to be permitted by private boat, with unrestricted landings along the Gulf of Mexico shoreline (except in designated swim areas).

The existing NPS docking facility would continue to provide for loading and unloading of passengers and materials for a concession-operated water transportation service and NPS personnel. A lateral pier connected to the existing NPS docking facility would be provided to accommodate safe loading and unloading of passengers on private watercraft. Long-term docking of private watercraft would not be permitted.

Visitor Opportunities. A number of visitor facilities would continue to be provided, including comfort stations, a concession facility, and picnic/shade shelters. A visitor contact station may be provided in this area.

To enhance access and to expand recreational opportunities within the marine environment, the feasibility of adding commercially provided recreational equipment rental service (canoe, kayak, etc.) provided as part of the commercial passenger ferry concession contract service would be evaluated.

Guided and self-guided interpretive tours would continue within Fort Massachusetts. The North Guard Rooms would provide for a sheltered visitor contact area and accommodate Eastern National operations. The South Guard Room would continue to be used for showing orientation film. Additional outdoor guided interpretive tours and educational programs would be provided in

other areas of the island. Interpretive waysides and a kiosk would continue to provide self-guided opportunities for interpretation and orientation.

To enhance visitor understanding of the role Fort Massachusetts played in our country's history, certain portions of the fort might be restored to reflect its historic operational appearance. Cannon firing demonstrations might be introduced that would require the purchase of reproduction cannon and carriage.

A permit system would be implemented to allow for backcountry camping in designated areas at least 1 mile east of Fort Massachusetts.

Resource Management. Natural resource management efforts would continue to emphasize inventory, monitoring, and trend analysis of nesting shorebirds, sea turtles, and raptors, and establishment of closure areas around active nesting sites. Volunteer assistance in the sea turtle management program would continue to be limited because of the logistics of accessing the island.

The national seashore would continue to collaborate with the U.S. Army Corps of Engineers to help restore the island's sediment transport and budget system that was disrupted by previous and ongoing dredging of adjacent navigation channels.

To minimize impacts on seagrass beds from vessel grounding, anchoring, and propeller scarring, a seagrass bed protection zone would be designated along the north shoreline.

Fort Massachusetts would continue to be protected and stabilized, including beach nourishment.

In collaboration with other agencies and as funding allows, periodic mapping and monitoring of seagrass bed conditions would continue.

Operations Support. Operations support facilities on the island would continue to be maintained, including ranger residences, bunkhouse/first aid station, equipment shed, utilities, and communication service.

East Ship Island

Access. Access to the island would continue by way of private watercraft or commercial service. Unrestricted landings along the Gulf of Mexico shoreline would continue to be permitted.

Visitor Opportunities. The island would be managed as primitive area. Visitors would have opportunities to experience a natural barrier island where solitude and the need to be self-reliant provide inspiration and challenge. The primitive island environment would provide the senses with high quality scenic views, natural sounds, dark night skies, and natural scents. Opportunities for primitive overnight camping along the beach areas would continue. A permit system would be implemented requiring camping in designated areas. This would facilitate monitoring of visitor use and its effect on island resources. Depending on future use levels the permit system might be extended to day users (including off-shore anchoring or mooring) to protect island resources.

On-site visitor services and facilities would not be provided. The Davis Bayou Visitor Center would continue as the main source of information to and interpretation of East Ship Island's history and resources.

Resource Management. Natural resource management efforts would continue to emphasize inventory, monitoring, and trend analysis of nesting shorebirds, sea turtles, and raptors, and establishment of closure areas around active nesting sites. Volunteer assistance in the sea turtle management program would continue to be limited in this area because of logistics.

The national seashore would continue to collaborate with the U. S. Army Corps of Engineers to help restore the island's sediment transport and budget system that

was disrupted by previous and ongoing dredging of adjacent navigation channels.

To minimize damage to seagrass beds from vessel groundings, anchoring, and propeller scarring, a seagrass bed protection zone would be designated along the north shoreline of the island.

Plans to provide beach replenishment adjacent to the French Warehouse archeological site are being developed through Mississippi Coastal Improvement Plan.

Operations Support. No on-site operations support facilities would be provided. Staff would need to respond to management issues via West Ship Island, Horn Island, or from Davis Bayou.

Horn and Petit Bois Islands (Designated Wilderness)

Access. Access to the islands would continue by way of private watercraft or commercial service. Unrestricted landings along the Gulf of Mexico shoreline would continue to be permitted.

The existing NPS docking facility on Horn Island would continue to be used for administrative purposes. A lateral pier connected to the existing dock would be provided to accommodate safe loading and unloading of passengers on private watercraft. Long-term docking of private watercraft would not be permitted.

Visitor Opportunities. Visitors would have opportunities to experience a barrier island wilderness, untrammeled by man, where solitude and the need to be self reliant provide inspiration and challenge. The primitive island environment would provide the senses with high quality scenic views, natural sounds, dark night skies, and natural scents. Visitor services and facilities would be limited, with only the island cross-over trail maintained. Opportunities for primitive overnight camping along the beach areas of the wilderness would continue. A permit system would be implemented requiring camping in designated areas. This would facilitate monitoring of visitor use and its effect on island resources. Depending on future use levels the permit system might be extended to day users (including off-shore anchoring or mooring) to protect island wilderness characteristics.

The Davis Bayou Visitor Center would continue to provide interpretation of Horn and Petit Bois Island's history and resources, as well as education on wilderness values, appropriate uses, and potential hazards. An interpretive wayside and/or kiosk would be added in the administrative enclave area to provide visitors with on-site information regarding the wilderness values, appropriate uses, and potential hazards.

Resource Management. Natural resource management efforts would continue to emphasize inventory, monitoring, and trend analysis of nesting shorebirds, sea turtles, and raptors, and establishment of closure areas around active nesting sites. Volunteer assistance in the sea turtle management program would continue to be limited in this area because of logistics.

The national seashore would continue to collaborate with the U. S. Army Corps of Engineers to help restore the island's sediment transport and budget system that was disrupted by previous and ongoing dredging of adjacent navigation channels.

The national seashore staff would continue to coordinate with the U.S. Department of Agriculture to eradicate the exotic cactus moth from the island.

To minimize damage to seagrass beds from vessel groundings, anchoring, and propeller scarring, a seagrass bed protection zone would be designated along the north shoreline.

Within the administrative enclave area on Horn Island, the use of the tractor trail between the dock and administrative area would be discontinued.

Operations Support. No on-site operations support facilities would be provided on Petit Bois Island. Staff would need to respond to management issues via West Ship Island, Horn Island, or from Davis Bayou.

On Horn Island, a small operations support center would continue to be maintained in the administrative enclave area, including ranger residences, bunk, and office complex, and a dock.

STAFFING AND COSTS

The staffing level under alternative 4 would be the equivalent of 108. Currently, the national seashore is authorized to have 111 FTE and therefore, this alternative would not require additional staffing beyond the authorized amount. Instead, the 22 FTE employees above the current level would support resource stewardship and visitor services envisioned under this alternative.

The breakdown of additional staffing needs by each management division is presented below.

The Superintendent's Office and Administrative Division would seek an increase in 2 full-time-equivalent employees, bringing their division's total to 12 full-time-equivalent employees to manage an expanded commercial services program, manage an expanded partnership program, and provide IT (information technology) support for both districts.

The Resource and Visitor Protection Division would seek an additional 4 full-time-equivalent employees bringing their division's total to 35 full-time-equivalent employees to support an increase in patrols within the marine environment, increase patrols on Cat Island, implement the camping permit system, and establish an on-site presence at Okaloosa.

The Interpretive Division would seek an additional 6 full-time-equivalent employees bringing their division's total to 16 full-time-equivalent employees to support expanded interpretive and educational programs; provide staffing at visitor contact stations at the Fort Pickens Ranger Station, and new visitor contact station and bookstore at Okaloosa and possibly the Pensacola Lighthouse; initiate the mobile interpretive van service to Perdido Key, Okaloosa, and Santa Rosa; and to support the education and research centers at Fort Pickens and Davis Bayou.

The Science and Resources Management Division would seek an increase of 6 full-time-equivalent employees, bringing their division's total to 15 full-time-equivalent employees to establish resource management programs for the marine environment and cultural resources, initiate resource inventory and monitoring efforts for Cat Island and on Eglin Air Force Base managed lands within the national seashore, and support expanded research programs coordinated through partnerships, and possibly initiate cultural resource stabilization and rehabilitation efforts for the Pensacola Lighthouse complex.

The Facility Management Division would seek an additional 4 full-time-equivalent employees bringing their division's total to 30 full-time-equivalent employees to proactively manage the deferred maintenance program, support new maintenance responsibilities at Fort Pickens, Naval Live Oaks, Perdido Key, Okaloosa, and Cat Island and possibly the Pensacola Lighthouse complex; and to maintain an expanded fleet of marine vessels needed for enhanced resource management and protection efforts.

Volunteers and partnerships would continue to be key contributors to NPS operations.

The cost estimates provided here are given for comparison to other alternatives only; they are not to be used for budgeting purposes. Although the numbers appear to be absolutes, they represent a midpoint in a possible range of costs. The total one-time cost for new facilities under this alternative is estimated at $17,400,000. Annual operating costs under this alternative would be $9,411,000. Presenta-

tion of these costs in this plan does not guarantee future NPS funding. Project funding would not come all at once; it would likely take many years to secure and may be provided by partners, donations or other nonfederal sources. Although the national seashore hopes to secure this funding and would prepare itself accordingly, the national seashore may not receive enough funding to achieve all desired conditions within the timeframe of the *General Management Plan* (the next 20 or more years).

COST SUMMARY OF ALTERNATIVES

The presentation of costs in a general management plan is applied to the types and general intensities of development in a comparative format. Though some costs are large, the National Park Service believes they are justified due to the size of the national seashore and the millions of visitors that it receives. Currently, the national seashore is authorized to have 111 full-time equivalent (FTE) employees and none of the action alternatives would require additional staffing beyond this authorized amount. Instead, staffing above the current level would support resource stewardship and visitor services envisioned under the action alternatives.

The table below summarizes the cost estimates for each alternative, including some of the larger facility development costs. The following applies to costs presented in this general management plan:

- The costs are presented as estimates and are not appropriate for budgeting purposes.
- The cost estimates were developed in 2008 in the Choosing by Advantages process and updated to 2010 dollars; they are very general and intended for alternative comparison purposes only.
- The cost estimates were developed using industry standards to the extent available and they represent the total costs of projects. New facilities would be constructed using sustainable methods and the best available technology.
- Actual costs would be determined at a later date and would take into consideration the design of facilities, identification of detailed resource protection needs, and changing visitor expectations.
- Approval of the general management plan does not guarantee funding or staffing for proposed actions. Project funding would not come all at once; it would likely take many years to secure and may be provided by partners, donations, or other nonfederal sources. Some proposals may not be funded within the life of this plan and full implementation may occur many years into the future. National seashore operations will continue as normal with no loss of service or resource protection during the period of implementation of the proposals detailed in this plan.

TABLE 2: COST ESTIMATES FOR THE ALTERNATIVES

	Alternative 1	Alternative 2	Alternative 3 (NPS Preferred)	Alternative 4
Annual Operating Costs (ONPS)[1]	$7,324,000	$8,542,000	$8,968,000	$9,411,000
Staffing (FTE)[2]	86	99	106	108
One-Time Costs[3]				
New maintenance facility at Naval Live Oaks	$0	$1,565,000	$1,565,000	$1,565,000
HQ / administration facility	$0	$2,458,000	$1,207,000	$0
Repurpose Lifesaving Station at Fort Pickens	$0	$0	$1,356,000	$1,356,000
Visitor facilities at Fort Pickens		$1,500,000	$2,370,000	$3,884,000
Stabilize Pensacola Lighthouse[4]	$0	$136,000	$136,000	$136,000
Facilities at Pensacola Lighthouse[4]	$0	$0	$422,000	$422,000
Cat Island dock construction	$0	$59,000	$59,000	$59,000
All other facilities	$0	$4,182,000	$2,385,000	$9,978,000
Non-Facility Costs	$0	$0	$0	$0
Total One-Time Costs	$0	$9,900,000	$9,500,000	$17,400,000

Footnotes:

1. Annual operating costs (ONPS) are the total costs per year for maintenance and operations associated with each alternative including utilities, supplies, staff salaries and benefits, leasing, and other materials. Cost and staffing estimates assume that the alternative is fully implemented as described in the narrative.
2. The total number of full-time-equivalent (FTE) employees is the number of person-years of staff required to maintain the assets of the national seashore at a good level, provide acceptable visitor services, and general support the national seashore's operations. The FTE number indicates ONPS-funded NPS staff only, not volunteer positions or positions funded by partners. FTE salaries and benefits are included in the annual operating costs. Currently, the national seashore is authorized to have 111 FTE employees.
3. One-time facility costs include those for the design, construction, rehabilitation, or adaptive reuse of visitor centers, roads, parking areas, administrative facilities, comfort stations, educational facilities, entrance stations, fire stations, maintenance facilities, museum collection facilities, and other visitor facilities.Costs for rebuilding roads and facilities that may be damaged by future storms may be large, but are unknown at this time and could vary over the life of this plan due to storm severity, amount of damage, and what decisions are made to rebuild specific facilities and roads on a case-by-case basis. Costs for underwater utility service to Fort Pickens is also unknown, and may be several million dollars.
4. At this time, the national seashore does not own or manage the Pensacola Lighthouse. However, these costs are presented in this plan to disclose the possible financial consequences should the seashore own the lighthouse in the future. The costs for stabilization of the Pensacola Lighthouse are anticipated to be higher than estimated in this table, but they are unknown at this time. The estimated costs are included in this table for comparision purposes only.

IMPLEMENTATION OF THE GENERAL MANAGEMENT PLAN

IMPLEMENTATION FUNDING

Although this *General Management Plan* provides the analysis and justification for future National Seashore funding proposals, this plan does not guarantee future NPS funding. Many actions would be necessary to achieve the desired conditions for natural resources, cultural resources, recreational opportunities, and facilities as envisioned in this plan. The National Park Service will request funding to achieve these desired conditions; although the national seashore hopes to secure this funding and would prepare itself accordingly, the national seashore may not receive enough funding to achieve all desired conditions.

Because NPS funding may be insufficient to accomplish the goals set by the plan, national seashore managers would need to continue to pursue other options, including expanding the service of volunteers, drawing upon existing or new partnerships, and seeking alternative funding sources, including the philanthropic community. Many people care deeply about their national parks, and these people are likely to continue to offer assistance in meeting NPS goals that matter most to them. Many potential partner groups exist whose missions are compatible with that of the national seashore, and these groups are likely to offer to work with the national seashore for mutual benefit. Even with assistance from supplemental sources, national seashore managers may be faced with difficult choices when setting priorities. The *General Management Plan* provides the framework within which to make these choices.

PUBLIC INVOLVEMENT

Most of these plans, such as the marine resource management plan, would require additional National Environmental Policy Act or compliance processes to involve the public in developing alternatives for management of the national seashore.

KEY IMPLEMENTATION PLANS

Commercial Services Plan

A commercial services plan would be programmed to determine the most feasible method (commercial use authorization, limited commercial use authorization, or concession contract) for providing commercial water transportation service all island areas of the national seashore. This would include the option to provide commercial service from the Davis Bayou Area.

Fort Pickens Development Concept Plan

When the location of a new docking facility is identified and programmed, a development concept plan would be initiated to identify site development, accessibility, interpretive programs, and cultural resource management implementation strategies.

Pensacola Lighthouse Development Concept Plan

The Pensacola Lighthouse is currently managed by the Pensacola Lighthouse Association under a long-term agreement with the U.S. Coast Guard. If management authority of the Pensacola Lighthouse was eventually transferred to the National Park Service, a development concept plan would be initiated to identify site development, accessibility, interpretive programs, and cultural resource management implementation strategies.

Cat Island Development Concept Plan

Upon completion of land acquisition for Cat Island, a development concept plan would be initiated for the federal lands of the island to identify the long term location of dock facilities, trail networks, resource restoration efforts, and infrastructure needs.

Marine Resources Management Plan

The National Park Service would develop a plan for management of the marine resources in national seashore waters in consultation with the public and with other federal and state agencies. It would identify the conditions necessary for appropriate management of fisheries, seagrass beds, and marine species in the national seashore. It would also identify specific management actions that would be undertaken to assure preservation of marine resources.

Wilderness Management Plan

The 2004 Wilderness Management Plan provides guidance on how wilderness areas in the national seashore should be managed. However, it does not include some of the National Park Service's current planning framework for wilderness areas. The national seashore is planning to update and expand its Wilderness Management Plan in the near future. Components of this plan may include guidance for inventory and monitoring of resources, a wilderness character narrative, a baseline wilderness character condition assessment, and development of a robust minimum requirements analysis process. It may also evaluate visitor use in backcountry and wilderness areas of the national seashore, and consider a permit system for backcountry use.

Asset Management Plan

The National Park Service is developing a national program for managing structures and facilities (assets) in park system units. This program is likely to call for development of an asset management plan for each park unit. Such plans are designed to provide park managers with a means of prioritizing, scheduling, and funding maintenance and repair work. They also include techniques to manage gaps between needed and anticipated funding, such as "mothballing" or even disposing of lower priority assets. The national seashore's asset management plan would follow the guidelines of the national program, including guidance for compliance with the National Environmental Policy Act, Sections 106 and 110 of the National Historic Preservation Act, and other applicable laws and policies.

Historic Resource Study

The national seashore is in need of completing a historic resources study, a foundational document all park units should have. A historic resource study is the primary document used to identify and manage the historic resources in a park. It is the basis for understanding their significance and interrelationships, and the framework within which additional research should be initiated. A historic resource study will help the national seashore better understand the significance of the cultural resources already identified within its boundaries, write or update National Register of Historic Places nominations, and make sound management decisions about these resources.

National Register of Historic Places Nominations

Several National Register of Historic Places nominations already have been completed for the national seashore. However, due to the standards that existed at the time they were written ten or more years ago, some of the nominations are lacking in detailed information about the resource(s). Rewriting or amending the existing nominations as needed to bring them up to current documentation standards, as well as including

more recent scholarship, will help the national seashore make sound management decisions for the preservation and or use of these cultural resources.

Historic Structure Report

If rehabilitation is the treatment chosen for Fort Barrancas, the national seashore would need to complete a historic structure report before proceeding with any work. The existing Fort Barrancas National Register of Historic Places nomination lacks in detailed historical information about the structure including how it has been used over the years. A historic structure report will outline the chronology of development and use, define the significant features, define the period(s) of significance, and make treatment recommendations. Having this information would allow the national seashore to make sound decisions about rehabilitating the structure.

Cultural Landscape Studies

A number of potential cultural landscapes exist within Gulf Islands National Seashore. These include the Naval Live Oaks Plantation, Fort Pickens, Fort Barrancas, Advanced Redoubt, and Fort Massachusetts. Cultural landscape inventories need to be completed for all of these areas prior to developing more site specific treatments to support management objectives outlined under each of the alternatives. If any of these landscapes were found to be eligible for the National Register of Historic Places, the national seashore would evaluate and develop appropriate short and long-term preservation strategies through the preparation of Cultural Landscape Reports.

MITIGATIVE MEASURES FOR THE ACTION ALTERNATIVES

In the legislation that created the National Park Service, Congress charged the agency with managing lands under its stewardship "in such manner and by such means as will leave them unimpaired for the enjoyment of future generations" (National Park Service Organic Act). As a result, the National Park Service routinely considers and implements mitigative measures whenever activities that could adversely affect the resources or systems are anticipated. Mitigation means to take action to avoid, reduce, or compensate for the effects of environmental damage.

A common set of mitigative measures would be applied to the action alternatives in this *General Management Plan*. The National Park Service would avoid, minimize, and mitigate adverse impacts whenever practicable.

GENERAL

New facilities (e.g., campsites, trails, bicycle trails) would be sited to minimize impacts on resources, including avoiding wetlands and sensitive areas and placing new facilities as close to existing disturbances as feasible. Before any construction activity, construction zones would be identified with temporary fencing to confine disruptions to the minimum area required. All protection measures would be clearly stated in the construction specifications, and workers would be instructed to avoid areas beyond the fencing.

Construction activities would implement standard soil erosion and stormwater runoff prevention methods such as use of silt fencing to avoid erosion and runoff in flowing water environments or during rain events.

Outdoor lighting for new or rehabilitated facilities would be the minimum amount required to provide for personal safety. Lights would also be shielded and/or directed downward to minimize impact on the night sky.

Standard noise abatement measures would be implemented, as appropriate, during park operations and construction activities. Examples include: scheduling activities so that impacts are minimized, use of the best available noise control techniques, use of hydraulically or electrically powered tools, and situating noise-producing machinery as far as possible from sensitive uses or resources.

CULTURAL RESOURCES

The National Park Service would preserve and protect, to the greatest extent possible, the cultural resources of Gulf Islands National Seashore. Specific mitigating measures would include the following:

- Continue to develop inventories for and oversee research about archeological and historical resources (structures and cultural landscapes) to better understand and manage the resources. Continue to manage cultural resources and collections following federal regulations and NPS policies and guidelines. Maintain the national seashore's museum collection in a manner that would meet NPS curatorial standards.

- Subject proposed projects to site-specific planning and compliance. Make every effort to avoid adverse impacts through the use of the *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation*. If adverse impacts could not be avoided, mitigate these impacts through a consultation process with all interested parties.

- As appropriate, archeological surveys and/or monitoring would precede any ground disturbance activities. Known archeological resources would be avoided to the greatest extent possible during construction. If archeological resources that are listed in or are eligible

for listing in the National Register of Historic Places could not be avoided, an appropriate data collection plan would be developed in consultation with the state historic preservation officers. If during construction previously unknown archeological resources were discovered, all work in the immediate vicinity of the discovery would be halted until the resources could be identified and documented and, if the resources cannot be preserved in situ, an appropriate mitigation strategy could be developed in consultation with the state historic preservation officers.

- The appearance and condition of historic structures before rehabilitation or restoration and changes made during treatment would be documented. Such documentation would be shared with the state historic preservation offices and added to the national seashore's cataloging system.

- Materials removed during rehabilitation efforts would be evaluated to determine their value to the national seashore's museum collections and/or for their comparative use in future preservation work at the sites.

Before conducting any actions outlined in the alternatives identified in this *General Management Plan* that could affect cultural resources that are listed in or eligible for listing in the National Register, the undertaking would be subjected to the requirements of 36 CFR 800 in compliance with Section 106 of the National Historic Preservation Act of 1966 (as amended). The National Park Service would therefore consult with the Florida or Mississippi state historic preservation officers, tribal representatives, and other interested parties.

NATURAL RESOURCES

General

Activities with the potential to disturb natural resources would be monitored for use-related impacts. Management options could range from (a) placing structures to limit impacts (e.g., sand ladders and boardwalks) or redirect visitors (i.e., fences), (b) education, and (c) guided activities, and (d) limiting access through a permit system.

Wetlands

Trails and other developments would avoid wetlands and "Waters of the United States" (all waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce) to the extent feasible. Where crossing or impingement upon wetlands is unavoidable, design and construction would minimize impacts on the wetlands. All potential impacts on wetlands would require state and federal permits. A wetland statement of findings would be prepared for all actions potentially impacting wetlands per NPS policies.

Geology and Soils

Structures such as sand ladders, boardwalks, and sidewalks would be used to reduce impacts on the substrate, and silt fences would be used to control erosion and runoff. Steep slopes and inundated areas would be avoided.

Vegetation and Wildlife

Trails/paths would be placed as close to existing disturbances as possible. The construction footprint would be minimized for both temporary and permanent impacts. Construction would take place outside peak breeding and nesting seasons.

Threatened and Endangered Species

Surveys would be conducted, as appropriate, for threatened and endangered species and species of concern before ground-disturbing activities are undertaken.

Impacts on federally threatened or endangered species are analyzed in detail in this document (see chapters 3 and 4 for details).

Current monitoring programs would be continued under all action alternatives, including but not limited to the following:

- An active sea turtle monitoring program occurs during the period May 1 - November 30 using replicate survey protocols for detecting and identifying nests soon after their becoming established. Each nest is identified and a protective inclosure perimeter established to maximize any inadvertent trampling by visitors or operational/management actions. Each nest is also posted with an informational sign to alert passers by to the nest and effectively close an approximate 5 meter square area to ingress/egress through the area for the approximate 60-day gestational period until hatchlings emerge and enter the ocean.

- Mitigation for impacts on the critically endangered Perdido Key beach mouse would continue with actions defined in the Perdido Key Beach Mouse Recovery Plan, developed by the national seashore and U.S. Fish and Wildlife Service. These measures include maintaining boardwalk crossovers, and installating rope barriers to discourage incidental take of the beach mouse and minimize habitat trampling.

- As mitigation for impacts on gopher tortoises, barriers would continue to be installed to keep tortoises from crossing the roadway and being killed by vehicles. Mesh fences are currently used to discourage wayward turtles from wandering into roadways. Burrows are also monitored as they become established to detect continued presence and absence. Periodically, comprehensive surveys, including marked recapture, are conducted to estimate population relative abundance and distribution.

- During the period March through August, the national seashore is involved in a focused and committed effort to maximize the protection of shorebirds within both districts. Areas where concentrations of solitary nesting shorebirds (e.g. snowy plover) are identified, and where appropriate cordoned off by establishing perimeter inclosures to control access, prevent encroachment to the extent possible, and therefore minimize impacts. While vehicular traffic on the Fort Pickens and J. Earle Bowden Way roadways remains a concern with respect to mortality adjacent to shorebird nesting colonies from passing motorists, the Park continues to engage other regulatory agencies in coordinating efforts to reduce road kill. Specifically, the park in cooperation with the U.S. Fish and Wildlife Service and Florida Fish and Wildlife Conservation Commission meet on an annual basis to outline management actions, including:

1. Implementation of speed limit reduction zones during the primary shorebird nesting period April through August.
2. Deployment of speed radar detection signs and message reader boards to alert motorist to adjacent shorebird nesting activities.

3. Installation of speed bumps at strategic locations to better assure compliance with the speed limit reduction zones.
4. Hand out brochures at the Fort Pickens and Santa Rosa entrance stations seeking motorist cooperation to abide by the reduced posted speed limit zones (20 mph in some areas adjacent to long stretches of roadway where nesting colonies become established).
5. Increase law enforcement would continue during the shorebird nesting period in proximity to posted speed limit reduction zones in Florida, as well as increased patrols by staff on the islands.
6. Continue effort to install/convert to low pressure sodium lights (LPS) for all external lighting fixtures on GUIS facilities to minimize artificial light pollution and reduce sea turtle disorientation.
7. Continue contributions to interagency outreach and education effort to encourage landowners on the gulf coast to convert to LPS light fixtures.
8. Continue to provide press releases and news media encouragement to prepare feature stories about shorebirds and public cooperation.

Conservation measures would be undertaken to reduce potential impacts on federally listed species or candidate species as needed. Conservation measures would be implemented in consultation with the U.S. Fish and Wildlife Service and would be required if:

- activities expected to have impacts on listed species or their designated critical habitat beyond those addressed in this document were initiated
- activities anticipated to have impacts on listed species' populations were initiated

Should any of the above events occur, renewed discussion and consultation with the U.S. Fish and Wildlife Service would focus on development of specific conservation measures to reduce potential impacts on these species and/or designated critical habitat. Such conservation measures would be based on the recommendations provided by the U.S. Fish and Wildlife Service on a project basis during consultation.

Conservation measures would likely include, but would not be limited to, the following:

- Protecting sensitive species by fencing or another system designed to prevent impacts from human activity and discourage predators.
- Restricting visitor use from certain breeding areas during the breeding season.
- Providing education about species and habitats and conservation.
- Designating alternate access points.
- Design and construction of structures or mechanisms for safe gopher tortoise movement such as road underpasses.

IDENTIFICATION OF THE NPS PREFERRED ALTERNATIVE

After reviewing public comment on the preliminary range of alternative management concepts, the planning team proceeded to refine the alternatives by developing more specific descriptions for the type and general intensities of development (including access) for each of the national seashore's 12 management units. Once this was complete, the planning team analyzed the anticipated environmental consequences and estimated costs associated with implementing each alternative.

To identify the NPS preferred alternative, the planning team applied an objective evaluation process called "Choosing by Advantages" (CBA). In using this process, the planning team asks, "What and how large are the advantages of each alternative?", "How important are these advantages?", and finally "Are these advantages worth their associated costs?" The CBA process does not "weigh" evaluation criteria in advance so that certain criteria are automatically more important than others. Rather, the process focuses on the differences (advantages) between alternatives and how important those differences are. Five factors were developed to describe and distinguish the advantage values of each of the four alternatives:

Factor 1: Provide Quality Visitor Experience Opportunities

Factor 2: Protect Wilderness Values

Factor 3: Protect, Enhance, and Restore Gulf Coastal Ecosystems

Factor 4: Provide Socioeconomic Benefits to Nearby Communities

Factor 5: Improve Efficiency of NPS Operations

A matrix was established that listed all the alternatives across the top with a listing of the factors down the left-hand margin. Next attributes were defined under each alternative for each factor. Attributes are consequences or characteristics of an alternative. When this was completed, the least preferred set of attributes within each factor was identified. Next, attributes were compared between alternatives to establish advantages. The system has the capability of comparing similar as well as dissimilar variables, and quantifiable as well as nonquantifiable variables. Once all the advantages statements are described, the group identified the highest advantage in each factor.

Factor 1: Provide Quality Visitor Experience Opportunities: Alternative 4 provides the most choice, access, and service.

Factor 2: Protect Wilderness Values: Alternative 2 provides the greatest protection of wilderness values.

Factor 3: Protect, Enhance, and Restore Gulf Coastal Ecosystems: Alternative 2 provides the greatest protection, enhancement, and restoration of coastal ecosystems. This became the paramount advantage CBA process.

Factor 4: Provide Socioeconomic Benefits to Nearby Communities: Alternative 4 provides the greatest benefit to nearby communities.

Factor 5: Improve Efficiency of NPS Operations: Alternative 3 provides the most efficient

The greatest advantages within each factor were then compared against each other to determine which provided the paramount advantage and was assigned a value of 100. In making this determination, consideration was given to what would be the most important issue to resolve in the management plan. The remaining advantage statements were then

compared against the paramount advantage and assigned a value.

Once the advantage values for alternatives were tallied, a total level of importance score was identified for each alternative. Alternative 3 provided the highest value at 190. Alternative 4 followed closely behind with a score of 175. Alternative 2 and Alternative 1 scored 115 and 110 respectively.

The relationship of advantage values and estimated implementation costs for each alternative were then plotted on a chart.

Alternative 3 provided the overall best value (greatest total advantage for the cost expended). Next, the planning team proceeded into the final phase of the evaluation and examined if there where elements of any of the other alternatives that could be incorporated or substituted for elements of alternative 3 to enhance value and/or reduce costs. The primary adjustments included adding research to the educational emphasis by collaboration/cooperation of academia/scientists, agencies, and other conservation organizations and reducing the level of new infrastructure proposed at Perdido Key and Cat Island.

A modified version of alternative 3 was selected as the preferred alternative.

ENVIRONMENTALLY PREFERABLE ALTERNATIVE

The National Park Service is required to identify the environmentally preferable alternative in its environmental impact analysis documents for public review and comment. The Park Service, in accordance with the Department of the Interior policies contained in the *Department Manual* (516 DM 4.10) and the "Council on Environmental Quality's Forty Questions," defines the environmentally preferable alternative (or alternatives) as the alternative that best promotes the national environmental policy expressed in the National Environmental Policy Act (Section 101(b)). Section 101 states that "it is the continuing responsibility of the federal government to

(1) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
(2) assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
(3) attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;
(4) preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity, and variety of individual choices;
(5) achieve a balance between population and resource use which would permit high standards of living and a wide sharing of life's amenities; and
(6) enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

The alternatives do not differ much with respect to criteria 1 and 6; therefore, this evaluation focuses on criteria 2, 3, 4, and 5.

Alternative 1, the no-action alternative, represents "business as usual" and was included to provide a baseline against which to compare the effects of the other (action) alternatives. Alternative 1 partially meets criterion 2; the current imbalance between visitor amenities is not fully addressed. Alternative 2 partially realizes criterion 3 because it does not comprehensively address challenges in the areas of resource protection and visitor use that face the national seashore now and in the future. Alternative 1 also does not fully realize criterion 4 because it does not provide improved protections for and visitor access to historic, cultural, and natural resources. Alternative 1 does not address changes in visitation patterns at the national seashore.

Alternative 2 fully realizes criterion 2 because it emphasizes protection of cultural resources as well as a return to more natural processes in some areas of the national seashore. This alternative partially realizes criterion 3 because it allows for a high level of natural resource protection, but it may limit the widest range of beneficial uses by visitors in the long-term. Alternative 2 partially meets criteria 4 and 5 by preserving important cultural and natural resources throughout the national seashore. However, it may limit individual choice in the long term because of diminished opportunities for visitor access—because of the possible abandonment of Fort Pickens Road following a highly destructive storm and reduced visitor services on some of the barrier islands.

Alternative 3, the NPS preferred alternative, fully realizes criteria 2 and 3 by providing a wide range of visitor opportunities and safe and appropriate amenities. Compared to the other alternatives, alternative 3 provides the widest range of beneficial uses for research, resource protection, and visitor opportunities. Alternative 3 partially realizes criterion 4 because it preserves important resources and allows for a variety of individual choices. However, in some areas, natural resources may be diminished to provide greater visitor opportunities, such as visitor activities on the barrier islands that may cause adverse impacts

on natural resources. Alternative 3 fully meets criteria 5 because it allows for access by the large local and visitor populations to enjoy high-quality national seashore resources and amenities.

Alternative 4 partially meets criteria 2 by providing safe surroundings, but emphasis on visitor opportunities may diminish the experience for some visitors because of potential crowding and the greater presence of commercial services. Alternative 4 only partially meets criteria 3 because it does not provide a very wide range of beneficial uses, because emphasis is placed on visitor education and recreational opportunities and access. Alternative 4 only partially realizes criterion 4 because it preserves the most important historic, cultural, and natural resources, but some resources may be modified to provide the widest range of visitor opportunities. Because of the implementation of fees at the Okaloosa Area and the emphasis on diversified recreation, alternative 4 only partially realizes criterion 5 because it may limit visitor access because of cost, or enjoyment because of diminished resource values and crowding. However, this alternative may provide some visitors with enhanced enjoyment of life's amenities because of diversified education and recreational opportunities in the national seashore.

After considering the environmental consequences of the four management alternatives, including consequences to the human environment, the National Park Service has concluded that alternative 3, the NPS preferred alternative, is also the environmentally preferable alternative. This alternative best realizes the full range of national environmental policy goals as stated in section 101 of the National Environmental Policy Act.

TABLE 3. SUMMARY COMPARISON OF THE ALTERNATIVES

TOPIC/AREA	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4
Concept	*Gulf Islands National Seashore would be managed to continue the protection of its northern Gulf Coast resources and to restore visitor services lost during the hurricanes of 2004-2005.*	*Gulf Islands National Seashore would be managed to adapt to the wild and dynamic processes of the northern Gulf Coast while providing seashore recreational and educational opportunities. The level of infrastructure to support visitor services on barrier island areas is adapted or removed as the environment changes over time.*	*Gulf Islands National Seashore would be managed as an outdoor classroom for exploring the natural and human history of the northern Gulf Coast while providing seashore recreational opportunities. Collaboration and cooperation between a consortium of academia, visiting scientists, conservation organizations, and other agencies would be actively pursued to enhance resource management, steward-ship, and understanding of the northern gulf coastal environment.*	*The National Park Service would seek to collaborate and expand partnerships with educational and cultural institutions, nonprofit organizations, and commercial service providers, to promote a greater array of national seashore recreational and educational opportunities among a variety of coastal settings.*
Visitor Experience	The national seashore would continue to provide opportunities for traditional beach activities and marine activities, as well as hiking, biking, motor touring, camping, picnicking, backcountry use, exploration of coastal fortifications, and other uses compatible with the protection of the national seashore's scenic, natural, and cultural values. These opportunities range from recreating with large groups within developed to semideveloped areas to finding solitude within an undeveloped wilderness island setting.	Same as alternative 1.	Same as alternative 1.	Same as alternative 1.
		When storms or other natural processes significantly impact barrier island infrastructure, contemporary accommodations would not be rebuilt. Interpretive/educational programs, visitor services, and recreational activities would adapt to these changed conditions. Visitors would be provided with more dispersed and primitive recreational opportunities. Seashore recreational opportunities on mainland areas would continue to be provided within a full range of developed to undeveloped settings.		Greater emphasis would be placed on expanding and diversifying the range of outdoor recreational opportunities available among a variety of coastal settings. Selected sites could include areas that accommodate a high level of visitor use while providing for a diversity of visitor opportunities. In some cases expanded commercial services could provide recreational equipment rentals, water-based transportation, and food service.
	The interpretive program would continue to foster public awareness and appreciation of the fundamental resources and values of the national seashore through six primary interpretive themes.	In addition to supporting the existing interpretive goals, accommodations for interpretive/educational programs on barrier islands would adapt to a more undeveloped setting and rely more on nonpersonal services. Conversely, national seashore interpretive and educational opportunities on mainland areas would be expanded to compensate for changes on the barrier islands.	In addition to supporting the existing interpretive goals, greater emphasis would be placed on using the national seashore as an outdoor classroom to provide visitors with expanded on-site learning opportunities. The national seashore would establish an environmental education center and develop an active stewardship program while providing educational and interpretive opportunities that explore the role that natural systems and coastal fortifications have played in the area.	Similar to alternative 1, the interpretive program would continue to foster public awareness and appreciation of the fundamental resources and values of the national seashore. Greater emphasis would be placed on using the national seashore as an outdoor classroom to provide visitors with on-site opportunities to explore and learn about the northern Gulf Coast ecology and human history while also continuing to provide recreational opportunities.
			History would be brought to life at selected coastal fortifications by actively presenting stories of important periods of their history.	Same as alternative 3.
			Visitors would also have guided and self-guided opportunities to explore coastal and barrier island ecology.	Same as alternative 3.
				The national seashore would collaborate with educational and cultural institutions, nonprofit organizations, and commercial services to provide visitors with a wide range of seashore opportunities.
				The national seashore would collaborate with and support regional educational and research programs focusing on preservation and understanding of the natural and cultural environment of the northern Gulf Coast.

TOPIC/AREA	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4
Visitor Experience (cont.)	Natural resources would continue to be managed to preserve the integrity of the national seashore's fundamental terrestrial, estuarine, and marine ecological resources while ensuring that visitors have access to a range of recreational opportunities within a wide variety of coastal settings.	Natural resources would be managed to preserve the integrity of the national seashore's fundamental terrestrial, estuarine, and marine ecological resources. As the barrier island environment continues to evolve as part of its dynamic coastal processes, management would adapt the level of visitor services, infrastructure, and modes of access in these areas.	Natural resources would be managed to preserve the integrity of the national seashore's fundamental terrestrial, estuarine, and marine ecological resources while providing visitor access to seashore settings that best illustrate the natural evolution of geologic, environmental, and ecological processes and/or the area's collection of heritage resources.	Natural resources would be managed to provide a variety of settings that support access and opportunities for visitors. More intervention and management techniques might be required to provide such opportunities while also protecting the natural environment to the greatest extent possible. In nonsensitive areas, natural resources could be modified to provide and accommodate a range of recreational activities, visitor services, and interpretive/ educational programs.
		The key component for achieving the desired natural resource conditions would include establishing a marine management program to inventory and monitor the overall marine environment, including submerged cultural resources. To support this initiative, collaboration, coordination, and cooperation between a consortium of academia, visiting scientists, conservation organizations, and other agencies would be encouraged and actively pursued.	Same as alternative 2.	
				In locations where natural resources are more resilient to human impacts and visitation, these sites could be modified or developed to provide greater access and capacity for an expanded and assorted range of new recreational opportunities.
Cultural Resource Conditions	Based on cultural resource condition assessments, stabilization efforts would continue on the historic fortifications, associated structures, archeological sites, and museum collections. These resources would be evaluated, monitored, and protected in accordance with NPS historic preservation policies and legislative and executive requirements.	Under this alternative, a cultural resource management program would be established to compliment the marine management program. Submerged cultural resources would be identified and documented, and preservation strategies would be developed.	Same as alternative 2.	
		The current condition of the historic masonry forts, artillery batteries, and associated structures would be documented, stabilized, and preserved. Archeological sites would be tested to determine the level of significance, data potential, and condition. After a major storm or other natural event, cultural resource conditions would be assessed and recovery efforts would be limited to repair and stabilization, and as possible, data acquisition from the impacted element.	Selected historic forts, artillery batteries, and associated structures would be rehabilitated to portray their appearance/function during a specific operational period(s). Actions would not alter the integrity of historic properties to allow for the enhancement of visitor experience.	Where their integrity would not be compromised, the masonry forts, artillery batteries, and their associated structures would be adaptively used to support a diverse range of recreational, interpretive, and educational opportunities. In addition, historic properties lacking potential for restoration to a specific operational period would be evaluated for their potential to be rehabilitated to serve contemporary uses.
AREA-SPECIFIC MANAGEMENT ACTIONS—FLORIDA UNITS				
Naval Live Oaks Area	**Access**. Access by land would continue via U.S. Highway 98. The existing bicycle/pedestrian trail connection along the south side of U.S. 98 would continue to provide visitors with an alternative means of accessing the Naval Live Oaks Area. Access by water would continue to be permitted by private boat, with unrestricted options for boat landings along the Pensacola Bay and Santa Rosa Sound shorelines.	**Access.** Same as alternative 1 except options for boat landings along the Pensacola Bay and Santa Rosa Sound shorelines might be restricted to designated areas. A dock facility (no ramp) might be provided on the Santa Rosa Sound side near the visitor center.	**Access.** Same as alternative 2.	**Access.** Same as alternative 2 plus possibly provide a formalized boat landing on the Santa Rosa Sound side near the visitor center.
	Visitor Opportunities. Continue to provide visitor orientation/interpretation and Eastern National bookstore at the Naval Live Oaks Visitor Center. Continue to provide facilities for day use recreation, including picnic facilities and restrooms and facilities for organized youth	**Visitor Opportunities.** Same as alternative 1 except also provide formalized picnic area with comfort stations and primitive picnic and beach access area (with no restrooms or changing areas), and let the use of the youth group camping area accommodate any organized group.	**Visitor Opportunities.** Same as alternative 2 except the existing headquarters space would be adapted to establish an environmental education and research center. A collaboration of academia, scientists, public agencies, and other conservation organizations would be pursued to enhance opportunities for research and education.	**Visitor Opportunities.** Same as alternative1 for orientation and interpretation. Same as alternative 3 for cultural landscape. Also, some area trails might be formalized with permeable

TOPIC/AREA	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4
Naval Live Oaks Area (cont.)	group camping. Continue to provide interpretive nature trails to areas of special interest on both the north and south sides of Highway 98.		After completing a cultural landscape report, a small portion of the historic live oak plantation (< 5 acres) could be managed to reflect historic plantation conditions for interpretive/ educational purposes. Also, the use of the youth group camping area would be expanded to allow organized educational/ research groups.	paved surfaces to contain resource damage from heavy use. Possibly expand trail opportunities by using existing firebreaks. Similar to alternative 2 for day use recreational opportunities; however, the use of the youth group camping area would be expanded to allow any organized group or individual users.
	Resource Management. Natural resource management efforts would continue to emphasize terrestrial vegetation and wildlife management, using prescribed fire to enhance wildlife habitat and reduce hazardous fuels. Monitoring efforts would continue to assess trends in the resident gopher tortoise population. In collaboration with other agencies and as funding allows, periodic mapping and monitoring of seagrass bed conditions would continue.	**Resource Management.** Natural resource management efforts would continue to emphasize terrestrial vegetation and wildlife management, using prescribed fire to enhance wildlife habitat and reduce hazardous fuels. Monitoring efforts would continue to assess trends in the resident gopher tortoise population. To minimize damage to seagrass beds, designate a seagrass bed protection zone along the north and south shoreline areas extending into Santa Rosa Sound and Pensacola Bay.	**Resource Management.** Same as alternative 2.	**Resource Management.** Same as alternative 2.
	Operations Support. The visitor center/ headquarters complex at Naval Live Oaks would continue to be the main administrative office space for national seashore staff. Contemporary structures would continue to be used to accommodate Florida District maintenance support.	**Operations Support.** Similar to alternative 1, the visitor center/headquarters complex at Naval Live Oaks would continue to be the main administrative office space for national seashore staff. However, if a major storm takes out Fort Pickens Road, field staff at Fort Pickens (except maintenance staff) would relocate primarily into Naval Live Oaks headquarters facility. Administrative division staff would relocate into a leased facility outside the national seashore or into structures at the Pensacola Naval Air Station. Maintenance staff would relocate into a new consolidated maintenance complex constructed in the north maintenance compound to consolidate Florida District maintenance operations.	**Operations Support.** A new administrative facility would be constructed in the north maintenance compound. A new maintenance facility would be constructed in the same area to house the Florida District maintenance operations.	**Operations Support.** Similar to alternative 1, the visitor center/headquarters complex at Naval Live Oaks would continue to be the main administrative office space for national seashore staff. A new maintenance facility would be constructed in the same area to house the Florida District maintenance operations.
Pensacola Naval Air Station Historic Sites	**Access.** Access to the Naval Air Station via Florida State Highways 292 and 295 would continue.	**Access.** Same as alternative.	**Access.** Same as alternative 1.	**Access.** Same as alternative 1 plus evaluate the feasibility of a land-based shuttle service between Fort Barrancas and other points of interest. A commercial water-based service would also be explored.
	Visitor Opportunities. The visitor center and bookstore at Fort Barrancas would continue to provide orientation to and overall interpretation of the historic sites in the Pensacola Naval Air Station. Fort Barrancas, Bateria de San Antonio (Water Battery), and Advanced Redoubt would continue to be available for visitor exploration.	**Visitor Opportunities.** Same as alternative 1 for visitor center at Fort Barrancas. If NPS management of the Pensacola Lighthouse complex occurs, the site would be managed as an unstaffed feature of the national seashore.	**Visitor Opportunities.** Same as alternative 1 for visitor center at Fort Barrancas. If NPS management of the Pensacola Lighthouse occurs, the exterior would be interpreted and the keeper's quarters would be adaptively rehabilitated for use as a visitor contact station and bookstore with possible visitor access into the lighthouse interior, and possible staff office space. Additional interpretive exhibits would be added.	**Visitor Opportunities.** Same as alternative 1 for visitor center at Fort Barrancas. Same as alternative 3 for Pensacola Lighthouse without interpretive exhibits.
			Manage historic sites in this area as cultural landscapes (upon completion of cultural landscape report). Possibly restore selected features to portray their appearance/ function during specific historic operational periods for interpretive/educational purposes.	Same as alternative 3 plus add additional interpretive exhibits.

TOPIC/AREA	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4
Pensacola Naval Air Station Historic Sites(cont.)	**Resource Management.** Cultural resource management efforts would continue to emphasize ongoing stabilization efforts to preserve Fort Barrancas, Bateria de San Antonio (Water Battery), and Advanced Redoubt. Fort Barrancas, a National Historic Landmark, would be afforded special protection and impacts would be minimized.	**Resource Management.** Cultural resource management efforts would be as in alternative 1.	**Resource Management.** Cultural resource management efforts would be as in alternative 1.	**Resource Management.** Cultural resource management efforts would be as in alternative 1.
	The national seashore would continue to coordinate with Naval Air Station command to maintain the historic viewshed of Fort Pickens, Pensacola Pass, and Fort McRee areas.	The national seashore would enhance their coordination efforts with Naval Air Station command to maintain the historic viewshed of Fort Pickens, Pensacola Pass, and Fort McRee areas.	Same as alternative 2.	Same as alternative 2.
Perdido Key Area	**Access.** Access by land would continue from Highway 292. Johnson Beach Road would continue to provide for road shoulder parking with designated dune crossovers providing multiple access points to the beach along the Gulf of Mexico and the lagoon side.	**Access:** Same as alternative 1, but if Johnson Beach Road sustains more than 50% destruction from a storm, the 2 miles of road beyond Johnson Beach would not be rebuilt to restore natural conditions. The transportation corridor would transition into a multipurpose trail for pedestrian or bicycle use only.	**Access.** Same as alternative 2.	**Access.** Same as alternative 1.
				A multiuse path would be connected to the county walkway at the national seashore boundary extending to Johnson Beach (0.5 mile).
	Access by water would continue by private boat, with unrestricted options for boat landings along the Gulf and Big Lagoon shorelines and the Gulf of Mexico and Santa Rosa Sound shorelines (except in designated swim areas).	Same as alternative 1 but landing locations on the Big Lagoon side would be restricted to designated areas.	Access by water would continue to be permitted by private boat, with unrestricted landings along the Gulf of Mexico shoreline (except in the designated swim area). Landing locations on the Big Lagoon side might be restricted to designated areas.	Same as alternative 3.
	Visitor Opportunities. Continue to provide a recreation area at Johnson Beach with restrooms, parking, covered picnic facilities, and swim beach with lifeguard, as well as the small boat launch area and parking for canoe, kayak, and other small boat use on the lagoon side just north of the beach.	**Visitor Opportunities.** Same as alternative 1.	**Visitor Opportunities.** Same as alternative 1.	**Visitor Opportunities.** Same as alternative 1.
	Continue to interpret the history of Rosamond Johnson Beach and maintain the Discovery Trail on the north side of Perdido Key.	Same as alternative 1.	Same as alternative 1 plus introduce additional educational opportunities via a mobile interpretive/educational vehicle. Expanded interpretive/educational opportunities could include establishing interpretive canoe and kayak trails in Big Lagoon, initiating school programs in the area, and providing on-site interpretive programs of Fort McRee and on interpretive tour boats.	Same as alternative 1 plus introduce additional educational opportunities via a mobile interpretive/educational vehicle. Expanded interpretive/educational opportunities considered would be the same as alternative 3 plus construction of a new seasonal visitor orientation/ contact station and bookstore would be considered.
				Evaluate feasibility to provide recreational equipment rental services in the Johnson Beach area.
	The eastern side of Perdido Key would continue to be a popular anchorage.	The eastern side of Perdido Key would be a popular anchorage. A day-use permit system would be implemented to moderate the volume of boat landings. Overnight boat mooring in this area would be prohibited.	The eastern side of Perdido Key would be a popular anchorage. Additional restroom facilities would be provided in the eastern tip of the key.	The eastern side of Perdido Key would be a popular anchorage. Additional restroom facilities would be provided at existing dune crossovers along Johnson Beach Road and at the key's eastern tip.
				Explore options to rehabilitate the historic batteries to provide shelter for recreational users.
	Continue to allow primitive camping 0.5 mile beyond the end of the road. Walk-in campers would continue to sign in at the Johnson Beach ranger station to allow for overnight parking.	Continue to allow primitive camping 0.5 mile beyond the end of the road; however overnight stays would be restricted to walk-in campers only. Registration at the ranger station would still be required for overnight parking.	Continue to allow primitive camping 0.5 mile beyond the end of the road, although a permit system might be established for all overnight camping (land based and overnight mooring of boats).	Same as alternative 3.

TOPIC/AREA	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4
Perdido Key Area (cont.)	**Resource Management.** Natural resource management efforts would continue to emphasize inventory, monitoring, and trend analysis of nesting shorebirds and sea turtles. Volunteers would continue to help accomplish this effort. The national seashore would continue to collaborate with the U.S. Fish and Wildlife Service in assessing the conditions of the Perdido Key beach mouse populations.	**Resource Management.** Same as alternative 1.	**Resource Management.** Same as alternative 1.	**Resource Management.** Same as alternative 1.
	Spanish Cove and the shoreline areas between Redfish and Langley Point would continue to be closed to motorized vessels to protect sensitive seagrass bed areas.	Designate a seagrass bed protection zone the north shoreline of Perdido Key.	Designate a seagrass bed protection zone along the north shoreline on Perdido Key.	Same as alternative 3.
	Cultural resource management efforts would continue to emphasize ongoing stabilization efforts to preserve the remnant batteries and seawall of Fort McRee.	Same as alternative 1.	Same as alternative 1.	Same as alternative 1.
Fort Pickens Area	**Access.** Fort Pickens Road would continue to provide vehicular access between Pensacola Beach and the Fort Pickens Area. If feasible, the road would continue to be reconstructed after major storms.	**Access.** Fort Pickens Road would continue to provide vehicular access between Pensacola Beach and the Fort Pickens Area. If a storm creates the same or greater level of destruction (35% destruction) of the Fort Pickens access road as experience during the 2004 hurricane season, the section of road between the park boundary and the Fort Pickens Ranger Station would not be rebuilt. Asphalt debris and remnant road sections would be removed. Access to Fort Pickens would transition from private vehicle to access by foot, private boat, and possibly commercial ferry service and/or over-sand shuttle service. Administrative vehicular access (primitive) might be established along a designated travel corridor.	**Access.** Fort Pickens Road would continue to provide vehicular access between Pensacola Beach and the Fort Pickens Area. The intent of the national seashore is to reconstruct the road after major storms, if feasible. The National Park Service intends to continue access via Fort Pickens Road to Fort Pickens, but there are situations that may arise in the future where conditions become so altered that it is no longer feasible to build or maintain the road. This would be determined on a case-by-case basis. Other options to provide access to Fort Pickens would be considered given the circumstances of the storm(s) or other events that may cause such a decision to become necessary. The national seashore's hurricane recovery plan would include a provision to procure and deploy, if feasible, temporary surfacing to accommodate administrative vehicular and public foot/bike access to the Fort Pickens Area until road repairs could be completed after major storms.	**Access.** Same as alternative 3.
	If Fort Pickens Road was destroyed by a storm, no bicycle path would be rebuilt between the national seashore boundary and the campground. Designated bike trail opportunities would continue to be provided between the campground and Fort Pickens.	Same as alternative 1.	Bike and pedestrian access would continue to be permitted along the road shoulders. Other designated bike trail opportunities would continue between the campground and Fort Pickens.	Same as alternative 3.
	Access by water would continue to be permitted by private boat, with unrestricted landings from Pensacola Bay and the Gulf of Mexico (except in designated swim areas).	Access by water would continue to be permitted by private boat, with unrestricted landings along the Gulf of Mexico shoreline (except in designated swim areas).	Same as alternative 2.	Same as alternative 2.
	To enhance visitor access by water, a new passenger ferry pier will be constructed to accommodate commercial water-based transportation service and NPS administrative use. Planning for this pier is currently underway (via the Fort Pickens Ferry Pier Environmental Assessment and public process). If feasible, the pier may provide private boaters a safer opportunity to load and unload passengers.	Same as alternative 1.	Same as alternative 1, but land-based connections to the ferry pier and other ground transportation options in the Fort Pickens area would also be explored.	Same as alternative 3, but the feasibility to initiate/expand commercial passenger ferry service or other water-based transportation service to the Pensacola Naval Air Station and Naval Live Oaks from the Fort Pickens Area would also be evaluated.
	Visitor Opportunities. Continue to use historic structures in Fort Pickens to support visitor services. This includes the Fort Pickens visitor center and bookstore, concession food service, restrooms; library, Eastern National office, storage, auditorium, museum, and staff offices.	**Visitor Opportunities.** Same as alternative 1 plus use a historic structure near the new dock facility for a visitor orientation and contact station. Collocate campground registration function in this structure.	**Visitor Opportunities.** Same as alternative 1 plus possibly rehabilitate other portions of the district to portray their historic appearance and function with incorporated interpretive media to enhance visitor understanding. If supported through partnership efforts, rehabilitate other areas to accommodate a shared educational and research facility.	**Visitor Opportunities.** Same as alternative 3.

TOPIC/AREA	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4
Fort Pickens Area (cont.)	Continue to use the Fort Pickens Ranger Station for indoor exhibits and camper registration.	Same as alternative 1.	Possibly rehabilitate the downstairs interior of the Fort Pickens Ranger Station to portray its historic appearance/function and enhance visitor understanding of the Lifesaving Service.	Same as alternative 3.
	Continue to maintain contemporary structures to support visitor services, such as the entrance station, the restrooms, and picnic shelters.	Same as alternative 1.	Same as alternative 1.	Same as alternative 1.
	Continue to provide beach recreation facilities at Langdon Beach.	Same as alternative 1. If the Fort Pickens access road is removed, a new entrance facility might be provided near the eastern boundary.	Same as alternative 1.	Same as alternative 1 plus an additional swim beach area would be provided 0.25 mile beyond the east boundary at Pensacola Beach.
		Expand concession services to include recreational equipment rental to enhance access in the national historic district. Evaluate the feasibility of providing a seasonal over-sand shuttle service throughout the area.		Expand concession services to include recreational equipment rental to enhance access in the national historic district. Evaluate the feasibility to provide a seasonal shuttle service throughout the area.
	Continue to maintain contemporary campground to support RV and tent camping on several loops, including individual and group campsites, restrooms, electrical hookups, a Campground Store, and a dump station.	Same as alternative 1 plus designate a "tent camping only" zone in Loop A. If access road is destroyed by storms, the campground would no longer provide for RV camping and transition into tent camping only. Electrical hookups and dump station would be removed. Relocate campground registration to visitor contact center and Campground Store function to concession store at firehouse. Remove the Campground Store and restore the site.	Same as alternative 1 plus designate a "tent camping only" zone in Loop A. Remove existing Campground Store and replace with a more environmentally sustainable structure that could accommodate campground registration and Campground Store functions. Provide additional parking and circulation improvements.	Same as alternative 1 plus designate a "tent camping only" zone in Loop A. Expand campground to include walk-in tent campsites for ferry passengers, hikers, boaters, and bicycle riders. Remove existing Campground Store. Evaluate the feasibility of adapting one historic structure to accommodate camper registration and store functions. If not feasible, construct new structure as described in alternative 3. Provide additional parking and circulation improvements. Evaluate feasibility of converting campground operation into a concession-operated service.
	Continue to provide contemporary amphitheater structure for interpretive and educational programs.	Same as alternative 1.	Same as alternative 1.	Same as alternative 1.
	Continue to provide fishing and sightseeing opportunities at the fishing pier.	Same as alternative 1.	Same as alternative 1.	Same as alternative 1.
	Continue to provide interpretive trails, including the Blackbird Marsh Trail, Dune Nature Trail, Fort Pickens self-guided trail, and cross-over trail.	Same as alternative 1 plus provide additional boardwalk beach crossovers as needed to minimize resource damage.	Same as alternative 2.	Same as alternative 2.
	Resource Management. Natural resource management efforts continue to emphasize inventory, monitoring, and trend analysis of nesting shorebirds and sea turtles. Volunteer efforts continue to extend the reach of existing staff in accomplishing this effort.	**Resource Management.** Same as alternative 1.	**Resource Management.** Same as alternative 1.	**Resource Management.** Same as alternative 1.
		Designate a seagrass bed protection zone along the north shoreline area between Battery Worth and Pensacola Beach.	Same as alternative 2.	Same as alternative 2.
	Cultural resource management efforts would continue to emphasize ongoing stabilization efforts to preserve historic structures in Fort Pickens as well as the structures associated with the Fort Pickens Ranger Station.	Same as alternative 1.	Same as alternative 1.	Same as alternative 1.
	Operations Support. Continue to use historic structures in Fort Pickens to support Florida District operations and staff housing.	**Operations Support.** Same as alternative 1.	**Operations Support.** Same as alternative 1.	**Operations Support.** Same as alternative 1.
	The Fort Pickens Ranger Station would continue to be used as a ranger station, campground registration office, and district office space. The garage would continue to be used for equipment and boat storage.	If a storm destroys the Fort Pickens access road, relocate the primary district office space for science/resources management and interpretation to the Naval Live Oaks Area. Relocate ranger station function from the Fort Pickens Ranger Station into another historic structure closer to the Fort Pickens dock area.	Use the Fort Pickens Ranger Station for visitor use; relocate the ranger station, resource and visitor protection, and science and resources management office space into other historic structures in the Fort Pickens Area. Relocate the campground registration function to the Campground Store.	Same as alternative 3.

TOPIC/AREA	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4
Fort Pickens Area (cont.)		Relocate resource and visitor protection office space to other Florida units of the national seashore.		
		Relocate most Florida District maintenance functions to a new maintenance complex in the Naval Live Oaks north compound area. Maintain a limited maintenance staging presence with a couple of historic structures to accommodate limited storage and shop space.	Same as alternative 2.	Same as alternative 2.
	Continue to provide utility services (telephone, power, and sanitation). Continue to maintain the on-site wells and water distribution system. Continue to use the two above ground fuel tanks for vessels and equipment.	If utility systems are destroyed by a storm, evaluate feasibility of on-site sustainable systems that do not rely on extended utility services from Pensacola Beach.	Same as alternative 1 but assess the feasibility of using underwater electrical service.	Same as alternative 3.
Santa Rosa Area	**Access.** J. Earle Bowden Way, SR 399, would continue to be maintained as a two-way vehicular public access road and evacuation route between Pensacola Beach and Navarre Beach. Parking would continue to be allowed only in designated areas, and parking on road shoulders would continue to be prohibited. Bike and pedestrian access would continue to be allowed along the road shoulders. Continue to provide three beach access areas along the road with dune crossovers.	**Access.** Same as alternative 1. However, if a storm destroys 35% or more of the road, the road would be reconstructed to provide for a single-lane emergency access with sustainable surfacing material. The road would normally be closed for public vehicular access, but the public would be permitted to use the route for biking and hiking. Administrative vehicular access would be permitted.	**Access.** Same as alternative 1. The route could also be made available for a shuttle system or trolley service with shelters, if such a system were found to be feasible in the future.	**Access.** Same as alternative 1. The route could also be made available for a shuttle system or trolley service with additional turnouts that provide shelters, restrooms, and dune crossovers if such a system were found to be feasible in the future.
	Access by water would continue to be permitted by private boat, with unrestricted landings along the Gulf of Mexico and Santa Rosa Sound shorelines (except in designated swim areas).	Access by water would be permitted by private boat, with unrestricted landings along the Gulf of Mexico shoreline (except in designated swim areas). Landing locations on the Santa Rosa Sound side would be restricted to designated areas.	Access by water would continue to be permitted by private boat, with unrestricted landings along the Gulf of Mexico shoreline (except in designated swim areas).	Same as alternative 3.
	Visitor Opportunities. Continue to provide beach recreation facilities at Opal Beach, including restrooms, outdoor showers, portable lifeguard towers, picnic areas, dune crossovers, and parking.	**Visitor Opportunities.** Same as alternative 1 but if structures are destroyed by a storm, they would not be rebuilt. Debris would be removed, and the site would be restored to near natural conditions. However, entry point parking areas with restrooms would be permitted on the east and west ends.	**Visitor Opportunities.** Same as alternative 1 but if structures are destroyed by a storm, best available technology and design will be considered when deciding what type of facility and what materials will be chosen to replace the structure.	**Visitor Opportunities.** Same as alternative 3 plus expand capacity at Opal Beach and/or provide additional swim beach areas at the west and east ends of the area.
	Continue to maintain wayside exhibits and provide for on-site scheduled interpretive programs.	Same as alternative 1	Same as alternative 1 plus introduce additional educational opportunities via a mobile interpretive/educational vehicle.	Same as alternative 1 plus introduce additional educational opportunities via a mobile interpretive/educational vehicle. Provide wayside exhibits at new swim beach areas.
	Overnight camping would continue to be a prohibited activity.	Overnight camping would continue to be a prohibited activity.	Implement a permit system for primitive camping in designated areas for group educational programs, through hikers, and long distance paddlers.	Implement a permit system for primitive camping.
			Commercial services might be permitted to support on-site recreational activities.	Evaluate the feasibility of providing recreational equipment rental services.
	Resource Management. Natural resource management efforts would continue to emphasize inventory, monitoring, and trend analysis of nesting shorebirds and sea turtles. Volunteer efforts continue to extend the reach of existing staff in accomplishing this effort.	**Resource Management.** Same as alternative 1, but a seagrass bed protection zone would be implemented along the north shoreline.	**Resource Management.** Same as alternative 2.	**Resource Management.** Same as alternative 2.
	Operations Support. Continue to maintain operational support structures such as an entrance station, a maintenance/ranger station, lifeguard station, emergency medical services, office space, and storage within the Opal Beach Day Use Area.	**Operations Support.** Same as alternative 1, but if the J. Earle Bowden Way is converted to a one-way evacuation lane and the structures are destroyed by a storm, they would not be rebuilt. The entrance station function would shift to the east and west entry point areas.	**Operations Support.** Same as alternative 1, but if structures are destroyed by a storm, best available technology and design will be considered when deciding what type of facility and what materials will be chosen to replace the structure.	**Operations Support.** Same as alternative 3.

TOPIC/AREA	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4
Okaloosa Area	**Access.** Vehicular access to the Okaloosa Area would continue to be via U.S. Highway 98. Boat access to the Santa Rosa Sound would continue to be by small boat launch ramp and a trailer parking area.	**Access.** Same as alternative 1.	**Access.** Same as alternative 1.	**Access.** Same as alternative 1 plus possibly expand the launch ramp and parking area to accommodate larger vessels and/or more numerous smaller vessels.
	Visitor Opportunities. Continue to maintain the beach recreation facilities (picnic area, shelters, and restroom facilities with outdoor showers) at Okaloosa Beach and provide on-site orientation and interpretive wayside exhibits.	**Visitor Opportunities.** Same as alternative 1.	**Visitor Opportunities.** Same as alternative 1 plus establish a gateway presence and introduce additional structures (shade/picnic) and services to support day use. Introduce educational opportunities supported by a mobile interpretive/educational vehicle.	**Visitor Opportunities.** Same as alternative 1 plus lifeguard service would be provided for the first time at this area. Separate bathing and recreational areas would be designated. The parking area might be expanded. Enhance interpretive services and establish a gateway presence to the national seashore by providing a new on-site visitor contact station. Introduce educational opportunities supported by a mobile interpretive/educational vehicle.
	Resource Management. Natural resource management efforts continue to emphasize inventory, monitoring, and trend analysis of nesting shorebirds.	**Resource Management.** Same as alternative 1.	**Resource Management.** Same as alternative 1.	**Resource Management.** Same as alternative 1.
		The national seashore staff would seek cooperation with the Eglin AFB commander, the state, and surrounding municipalities and counties in regard to inventories and monitoring of natural and cultural resources on lands within the national seashore boundary.	Same as alternative 2.	Same as alternative 2.
	Operations Support. Continue to maintain volunteer trailer pad. Maintain site utilities serviced by adjacent municipality.	**Operations Support.** Same as alternative 1.	**Operations Support.** Same as alternative 1.	**Operations Support.** Same as alternative 1 plus accommodate a new ranger station with administrative office space.
AREA-SPECIFIC MANAGEMENT ACTIONS—MISSISSIPPI UNITS				
Davis Bayou	**Access.** Continue to use the 2.2-mile park entrance road connecting to U.S. Highway 90 to provide access to a number of recreational features in the Davis Bayou Area.	**Access.** Same as alternative 1.	**Access.** Same as alternative 1.	**Access.** Same as alternative 1 plus add multiuse trail adjacent to existing roadways to expand access and recreational opportunities.
	Continue to maintain water access for private boats to and from the Mississippi Sound by existing boat ramp. Continue to accommodate additional water access for paddlers at existing boat launch facility. Other facilities to be maintained include a public fishing pier at the visitor center and a public boat launch and shelter.	The public launch for motorized vessels would be phased out to minimize the need for dredging activities in the bayou. Water access for paddlers would continue. Adapt existing public fishing pier at the visitor center to also accommodate commercial water transportation service operators. Some dredging might be required.	Same as alternative 1 except adapt the public fishing pier at the visitor center to also accommodate commercial water transportation service operators. Some dredging might be required.	Same as alternative 3 except dredging and other navigational activities would be needed to support larger boats and increased use.
				To enhance access and to expand recreational opportunities in the area, evaluate feasibility of providing recreational equipment rental services.
	Visitor Opportunities. The Davis Bayou Visitor Center would continue to be the national seashore's Mississippi hub for providing visitors with orientation, information, interpretive exhibits, and book sales. Indoor and outdoor interpretive and educational programs would continue at the visitor center and the campground amphitheater.	**Visitor Opportunities.** Same as alternative 1.	**Visitor Opportunities.** Same as alternative 1 plus possibly construct a new amphitheater pavilion near the visitor center to accommodate larger groups and expanded interpretive programs.	**Visitor Opportunities.** Same as alternative 3.
	Continue to provide visitors water and land based opportunities for exploration and learning about the Davis Bayou ecosystem through guided and self-guided interpretive nature trails and guided boat interpretive tours.	Same as alternative 1 but do not restore the bayou boathouse if it is destroyed in a storm, but continue interpretive boat tours.	Same as alternative 1 plus adapt the old well shed to accommodate an environmental learning classroom area. Maintain the scenic viewshed around Davis Bayou.	Same as alternative 3.

TOPIC/AREA	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4
Davis Bayou (cont.)			Pursue a collaboration of academia, scientists, public agencies, and other conservation organizations to enhance opportunities for research and education.	Same as alternative 3.
	Continue to provide camping opportunities with access to power and water service hookups including campgrounds, group tent camping areas, restrooms, a volunteer RV campsite, and a fee station/office.	Same as alternative 1 plus designate a "tent camping only" zone within existing campground footprint.	Same as alternative 2.	Same as alternative 2.
	Continue to provide open space for group play. Continue to provide picnic opportunities and maintain existing facilities, including picnic shelters, restrooms, and the gazebo.	Same as alternative 1.	The open space near the Davis Bayou campground area would be used for outdoor environmental education and/or restored to a more natural environment. Picnic opportunities would continue to be provided.	Same as alternative 3.
	Continue to provide accessible fishing opportunities including the public fishing pier at the visitor center and the fishing pier gazebo. Commercial fishing guide service would continue to be permitted through commercial use authorizations.	Same as alternative 1.	Same as alternative 1.	Same as alternative 1 except expand public fishing pier.
				Develop a bluewater trail with markers in the Davis Bayou Area with possible connections to Cedar Point and USFWS Crane Refuge near the Ocean Springs Airport.
	Resource Management. Natural resource management efforts would continue to emphasize terrestrial vegetation and wildlife management, using prescribed fire to enhance wildlife habitat and reduce hazardous fuels. Methods for restoring the wetland prairie ecosystems while maintaining adequate screening of adjacent neighborhoods would continue to be tested. In partnership with the Gulf Coast Research Laboratory, the bayou and wetland systems would continue to be monitored and conditions assessed.	**Resource Management.** Same as alternative 1.	**Resource Management.** Same as alternative 1.	**Resource Management.** Same as alternative 1.
		Possibly investigate effects of the culverts under the Davis Bayou road on the bayou system. Possibly redesign culvert systems.	Same as alternative 2.	Sane as alternative 2.
	Cultural resource management efforts would continue to emphasize ongoing stabilization efforts for the CCC cabins. Continue to use dedicated space in the visitor center as an archival repository for specimens and objects collected in the Mississippi District .	Same as alternative 1.	Same as alternative 1.	Same as alternative 1.
	Continue to provide staff, volunteer, and partner housing at Davis Bayou within the CCC cabins and at the house and cottages on Boat Launch Road.	Same as alternative 1 plus provide a dormitory and emergency shelter within the maintenance area development footprint.	Same as alternative 1.	Same as alternative 1.
Cat Island	**Access:** Access to the island would continue by way of private watercraft or limited commercial service. Continue to allow unrestricted watercraft landings on federal lands from Mississippi Sound and the Gulf of Mexico. The national seashore would continue to coordinate with current land-owners to use their private dock to accommodate NPS boat access. Existing canal system and a majority of the existing road network would remain under private ownership and continue to provide private access to areas of the island's interior.	**Access:** Same as alternative 1 plus establish a new NPS docking facility to provide for administrative and commercial water transportation service use.	**Access:** Same as alternative 2.	**Access:** Same as alternative 2.

TOPIC/AREA	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4
Cat Island (cont.)	**Visitor Opportunities.** Visitors would continue to have opportunities to explore the eastern and southern areas of the island that are under federal ownership. Private lands would continue to be restricted from visitor use. Opportunities for primitive overnight camping on federal lands would continue.	**Visitor Opportunities.** Same as alternative 1 but a permit system would be implemented for primitive overnight camping on federal lands.	**Visitor Opportunities.** Same as alternative 2 plus establish (after land acquisition) a group campsite and a hiking trail system throughout federal lands using portions of the existing road network.	**Visitor Opportunities.** Same as alternative 3 but depending on future use levels the permit system might be extended to day users (including off-shore anchoring or mooring) to protect island resources.
				Evaluate feasibility of providing recreational equipment rental service bundled with commercial water transportation service.
	No on-site interpretive or educational facilities would be provided. Davis Bayou Visitor Center would continue as the main source of information to and interpretation of Cat Island's history and resources.	Same as alternative 1.	Same as alternative 1 plus provide interpretive waysides (on federal lands) at points of interest. Possibly also provide guided interpretive tours and educational programs.	Same as alternative 3 plus provide a small classroom with laboratory space (on federal lands) to enhance educational opportunities
	Resource Management. Natural resource management efforts would continue to be limited to just basic inventory and monitoring of resource conditions.	**Resource Management.** NPS staff would coordinate with the Mississippi Department of Marine Resources and private landowners to establish strategies for minimizing impacts on seagrass beds. The national seashore would identify shoreline landing locations on federal lands to aid in this effort.	**Resource Management.** Same as alternative 2.	**Resource Management.** Same as alternative 2.
		Upon completion of land acquisition, restore portions of the road and canal networks on federal lands that are no longer needed to provide visitor and/or private landowner access.	Same as alternative 2.	Same as alternative 2.
				Develop a small research facility to support a partnership science and research program.
	Cultural resource management efforts would continue to emphasize stabilization of the remnant features of the World War II Cat Island War Dog Reception and Training Center.	Same as alternative 1 plus conduct additional research to document the cultural history of the island and to map cultural features.	Same as alternative 2 plus also possibly conduct scientific research on this unique barrier island. A bunkhouse or other facilities to support research might be fitting in the future.	Same as alternative 3.
West Ship Island	**Access.** Access to the island would continue by way of private watercraft or concession operated passenger ferry service from Gulfport and/or Biloxi, Mississippi. Unrestricted landings, except in designated swim areas, along the Gulf of Mexico and Mississippi Sound shorelines continue to be permitted (except in designated swim areas).	**Access.** Access to the island would continue by way of private watercraft or commercial service. Access by water would continue to be permitted by private boat, with unrestricted landings along the Gulf of Mexico shoreline (except in designated swim areas). Landing locations on the Mississippi Sound side would be restricted to designated areas for seagrass protection.	**Access.** Access to the island continues by way of private watercraft or concession operated passenger ferry service from Gulfport and/or Biloxi, Mississippi. Access by water would continue to be permitted by private boat, with unrestricted landings along the Gulf of Mexico shoreline (except in designated swim areas).	**Access.** Access to the island continues by way of private watercraft or concession operated passenger ferry service from Gulfport and/or Biloxi, Mississippi. Access by water would continue to be permitted by private boat, with unrestricted landings along the Gulf of Mexico shoreline (except in designated swim areas).
	The existing NPS docking facility would continue to provide for loading and unloading of passengers and materials for a concession-operated water transportation service and NPS personnel. A lateral pier connected to the existing NPS docking facility would be provided to accommodate safe loading and unloading of private watercraft passengers. Long-term docking of private watercraft would not be permitted.	Same as alternative 1.	Same as alternative 1.	Same as alternative 1.
	Visitor Opportunities. Continue to provide a number of visitor facilities, including a visitor contact station, comfort stations, a concession facility, and picnic/shade shelters.	**Visitor Opportunities.** Same as alternative 1, but if these facilities are destroyed by a storm, only the cross island boardwalk access and the north area comfort station would be rebuilt. All visitor services such as food, water, and equipment rental would be provided on board the commercial passenger ferry.	**Visitor Opportunities.** Same as alternative 1.	**Visitor Opportunities.** Same as alternative 1.
				To enhance access and to expand recreational opportunities within the marine environment, evaluate feasibility of providing recreational equipment rental service provided as part of the commercial passenger ferry concession contract service.

TOPIC/AREA	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4
West Ship Island (cont.)	Guided and self-guided interpretive tours would continue within Fort Massachusetts. The North Guard Rooms would continue to provide for a sheltered visitor contact area and accommodates Eastern National operations. The South Guard Room would continue to be used for showing orientation film. Additional outdoor guided interpretive tours and educational programs would continue to be provided in other areas of the island. Interpretive waysides and kiosk would continue to provide self-guided opportunities for interpretation and orientation.	Same as alternative 1.	Same as alternative 1.	Same as alternative 1.
			To enhance visitor understanding of the role Fort Massachusetts played in our country's history, certain portions of the fort might be restored to reflect its historic operational appearance. Cannon firing demonstrations might be introduced that would require the purchase of reproduction cannon and carriage.	Same as alternative 3.
	Overnight camping would continue to be prohibited on the island.	Same as alternative 1.	Same as alternative 1.	A permit system would be implemented to allow for backcountry camping in designated areas at least 1 mile east of Fort Massachusetts.
	Resource Management. Natural resource management efforts would continue to emphasize inventory, monitoring, and trend analysis of nesting shorebirds, sea turtles, and raptors and establishment of closure areas around active nesting sites. Continue to protect and stabilize Fort Massachusetts including beach nourishment.	**Resource Management.** Same as alternative 1.	**Resource Management.** Same as alternative 1.	**Resource Management.** Same as alternative 1.
	The national seashore would continue to collaborate with the U.S. Army Corps of Engineers to help restore the island's sediment transport and budget system that was disrupted by previous and ongoing dredging of adjacent navigation channels.	Same as alternative 1.	Same as alternative 1.	Same as alternative 1.
		To minimize damage to seagrass beds, designate a seagrass bed protection zone along the north shoreline.	To minimize damage to seagrass beds, designate a seagrass bed protection zone along the north shoreline.	Same as alternative 3.
		Develop an alternative route for providing administrative access across the island to minimize impacts on wetland areas.		Same as alternative 2.
	Continue to protect and stabilize Fort Massachusetts including beach nourishment.	Same as alternative 1.	Same as alternative 1.	Same as alternative 1.
	Operations Support. Continue to maintain operations support facilities on the island including ranger residences, bunkhouse/first aid station, equipment shed, utilities, and communication service.	**Operations Support.** Same as alternative 1.	**Operations Support.** Same as alternative 1.	**Operations Support.** Same as alternative 1.
East Ship Island	**Access.** Access to the island would continue by way of private watercraft or commercial service. Unrestricted landings along the Gulf of Mexico and Mississippi Sound shorelines would continue to be permitted.	**Access.** Access to the island would continue by way of private watercraft or commercial service. Unrestricted landings along the Gulf of Mexico shoreline would continue to be permitted. Landing locations on the Mississippi Sound side would be restricted to designated areas.	**Access.** Access to the island would continue by way of private watercraft or commercial service. Unrestricted landings along the Gulf of Mexico shoreline would continue to be permitted.	**Access.** Same as alternative 3.
	Visitor Opportunities. The island would continue to be managed as primitive area. Visitors would have opportunities to experience an undeveloped barrier island. Opportunities for	**Visitor Opportunities.** Same as alternative 1 plus implement a permit system requiring camping in designated areas. Depending on future use levels, possibly extend the permit	**Visitor Opportunities.** Same as alternative 2.	**Visitor Opportunities.** Same as alternative 2.

TOPIC/AREA	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4
East Ship Island (cont.)	primitive overnight camping along the beach areas would continue.	system to day users (including off-shore anchoring or mooring) to protect island resources.		
	On-site visitor services and facilities would continue not to be provided. Davis Bayou Visitor Center would continue as the main source of information to and interpretation of East Ship Island's history and resources.	Same as alternative 1.	Same as alternative 1.	Same as alternative 1.
	Resource Management. Natural resource management efforts would continue to emphasize inventory, monitoring, and trend analysis of nesting shorebirds, sea turtles, and raptors, and establishment of closure areas around active nesting sites.	**Resource Management.** Same as alternative 1.	**Resource Management.** Same as alternative 1.	**Resource Management.** Same as alternative 1.
	The national seashore would continue to collaborate with the U. S. Army Corps of Engineers to help restore the island's sediment transport and budget system that was disrupted by past and ongoing dredging of adjacent navigation channels.	Same as alternative 1.	Same as alternative 1.	Same as alternative 1.
		To minimize impacts on seagrass beds from vessel grounding, anchoring, and propeller scarring, a seagrass bed protection zone would be established along the north shoreline of the island.	To minimize damage to seagrass beds from vessel groundings, anchoring, and propeller scarring, a seagrass bed protection zone would be designated along the north shoreline of the island.	Same as alternative 3.
	Operations Support. No on-site operations support facilities would be provided. Staff would need to respond to management issues via West Ship Island or from Davis Bayou.	**Operations Support.** No on-site operations support facilities would be provided. Staff would need to respond to management issues via West Ship Island, Horn Island, or from Davis Bayou.	**Operations Support.** Same as alternative 2.	**Operations Support.** Same as alternative 2.
Horn and Petit Bois Islands	**Access.** Access to the islands would continue by way of private watercraft or commercial service. Unrestricted landings along the Gulf of Mexico and Mississippi Sound shorelines would continue to be permitted. The existing NPS docking facility on Horn Island would continue to be used for administrative purposes.	**Access.** Same as alternative 1.	**Access.** Same as alternative 1.	**Access.** Same as alternative 1 plus provide a lateral pier connected to the existing dock to accommodate safe loading and unloading of passengers on private watercraft. Long-term docking of private watercraft would not be permitted.
	Visitor Opportunities. Visitors would continue to have opportunities to experience a barrier island wilderness. Visitor services and facilities would continue to be limited, with only the island cross-over trail maintained. Opportunities would continue for primitive overnight camping along the beach areas of the island wilderness.	**Visitor Opportunities.** Same as alternative 1 plus implement a permit system requiring camping in designated areas. Depending on future use levels the permit system might be extended to day users (including off-shore anchoring or mooring) to protect island wilderness characteristics.	**Visitor Opportunities.** Same as alternative 2.	**Visitor Opportunities.** Same as alternative 2.
	The Davis Bayou Visitor Center would continue to provide interpretation of Horn and Petit Bois Islands' history and resources, as well as education on wilderness values, appropriate uses, and potential hazards.	The Davis Bayou Visitor Center would continue to provide interpretation of Horn and Petit Bois Island's history and resources, as well as education on wilderness values, appropriate uses, and potential hazards. An interpretive wayside and/or kiosk would be added within the administrative enclave area to provide visitors with on-site information regarding the wilderness values, appropriate uses, and potential hazards.	Same as alternative 2.	Same as alternative 2.
	Resource Management. Natural resource management efforts would continue to emphasize inventory, monitoring, and trend analysis of nesting shorebirds, sea turtles, and raptors, and establishment of closure areas around active nesting sites. Volunteer assistance in the sea turtle management program would continue to be limited in this area because of logistics.	**Resource Management.** Same as alternative 1.	**Resource Management.** Same as alternative 1.	**Resource Management.** Same as alternative 1.

TOPIC/AREA	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4
Horn and Petit Bois Islands (cont.)	The national seashore would continue to collaborate with the U. S. Army Corps of Engineers to help restore the island's sediment transport and budget system that was disrupted by previous and ongoing dredging of adjacent navigation channels. The national seashore would continue to coordinate with the U.S. Department of Agriculture to eradicate the exotic cactus moth from the island.	Same as alternative 1.	Same as alternative 1.	Same as alternative 1.
		To minimize damage to seagrass beds from vessel groundings, anchoring, and propeller scarring, a seagrass bed protection zone would be designated along the north shoreline of the island.	To minimize damage to seagrass beds from vessel groundings, anchoring, and propeller scarring, a seagrass bed protection zone would be designated along the north shoreline of the island.	Same as alternative 3.
	Within the administrative enclave area on Horn Island, the use of the tractor trail between the dock and administrative area would be discontinued.	Same as alternative 1.	Same as alternative 1.	Same as alternative 1.
	Operations Support. No on-site operations support facilities would be provided on Petit Bois Island. Staff would need to respond to management issues via West Ship Island, Horn Island, or from Davis Bayou.	**Operations Support.** Same as alternative 1.	**Operations Support.** Same as alternative 1.	**Operations Support.** Same as alternative 1.
	On Horn Island, continue to maintain a small operations support center within the administrative enclave area including ranger residences, bunk, and office complex, and a dock.	On Horn Island, continue to maintain a small operations support center within the administrative enclave area including ranger residences, bunk, and office complex, and a dock.	On Horn Island, continue to maintain a small operations support center within the administrative enclave area including ranger residences, bunk, and office complex, and a dock.	On Horn Island, continue to maintain a small operations support center within the administrative enclave area including ranger residences, bunk, and office complex, and a dock.
		If administrative facilities (excluding the dock) are destroyed by a storm, they would not be rebuilt. Visitor and resource protection response would be from the Davis Bayou Area or from West Ship Island.	If facilities were destroyed by a storm, management would reassess the need to maintain an on-site NPS presence and facilities.	
Annual Operating Costs	$7,324,00	$8,542,000	$8,968,000	$9,411,000
Total One-time Costs	$0	$9,900,000	$9,500,000	$17,400,000
Staffing	86[1]	99	106	108

[1]Currently, the national seashore is authorized to have 111 full-time-equivalent (FTE) employees. Therefore, none of the action alternatives would require additional staffing beyond the authorized amount. Instead, the new employees above the current level would support resource stewardship and visitor services envisioned under this alternative within the authorized staffing level of 111 FTE.

TABLE 4: SUMMARY OF IMPACTS BY TOPIC FOR EACH ALTERNATIVE

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Impacts on Historic Structures	Implementing the no-action alternative would result in impacts on historic structures that are adverse, long term, and negligible to minor in intensity because of the proposed rehabilitation work that would result in the loss of historic fabric. Stabilization work would be beneficial and long term.	Implementing alternative 2 would result in impacts on historic structures that are adverse, long term, and negligible to minor in intensity because of the proposed rehabilitation work that would result in the loss of historic fabric. Stabilization work would be beneficial and long term.	Implementing alternative 3 would result in impacts on historic structures that are adverse, long term, and negligible to minor in intensity because of the proposed rehabilitation work that would result in the loss of historic fabric. Stabilization work would be beneficial and long term.	Implementing alternative 4 would result in impacts on historic structures that are adverse, long term, and negligible to minor in intensity because of the proposed rehabilitation work that would result in the loss of historic fabric. Stabilization work would be beneficial and long term.
Impacts on Geologic Processes	Implementation of the no-action alternative would result in the continuation of minor to moderate, long-term, adverse effects on natural geologic processes from roads and minor, long-term, adverse effects on island shape and natural geologic processes from unrestricted boat landings.	Implementing alternative 2 would result in several moderate, long-term, beneficial impacts and a long-term minor to moderate adverse impact on island geomorphology and natural geologic processes.	Implementing alternative 3 would result in moderate, long-term, beneficial impacts and moderate, long-term, adverse impacts on island geomorphology and natural geologic processes.	Implementing alternative 4 would result in moderate, long-term, adverse impacts and a minor, long-term, beneficial impact on island geomorphology and natural geologic processes.
Impacts on Soils	Implementing the no-action alternative would continue to have long-term, negligible to moderate, adverse impacts on national seashore soils.	Implementing alternative 2 would result in long-term minor and moderate beneficial impacts and a long term minor adverse impact on national seashore soils.	Implementing alternative 3 would result in long-term minor and moderate adverse impacts and a long-term minor beneficial effect on national seashore soils.	Implementing alternative 4 would result in long-term, minor and moderate, adverse impacts and a long-term minor to moderate, beneficial effect on national seashore soils.
Impacts on Water Quality	Implementing the no-action alternative would continue long-term negligible to moderate adverse impacts on water quality.	Implementing alternative 2 would result in long-term minor and moderate adverse impacts and minor to moderate beneficial impacts on water quality.	Implementing alternative 3 would result in long-term minor and moderate adverse impacts and a minor to moderate beneficial impact on water quality.	Implementing alternative 4 would result in long-term minor and moderate adverse impacts and a minor to moderate beneficial impact on water quality.
Impacts on Wetlands	Implementing the no-action alternative would continue long-term, moderate, adverse impacts on wetlands.	Implementing alternative 2 would have long-term, minor and moderate, beneficial impacts on wetlands.	Implementing alternative 3 would have long-term minor to moderate beneficial impacts and the continuation of long-term moderate adverse impacts on wetlands.	Implementing alternative 4 would have long-term, minor to moderate, beneficial impacts and long-term, moderate, adverse impacts on wetlands.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Impacts on Terrestrial Vegetation and Wildlife	Implementing the no-action alternative would continue long-term, moderate, adverse impacts on terrestrial vegetation and wildlife in the national seashore.	Implementing alternative 2 would result in minor to moderate, long-term, beneficial impacts with several minor to moderate, long-term, adverse impacts on terrestrial vegetation and wildlife.	Implementing alternative 3 would largely result in minor to moderate, long-term, adverse impacts and some minor to moderate, long-term, beneficial impacts on terrestrial vegetation and wildlife.	Implementing alternative 4 would result in minor to moderate, long-term, adverse impacts and a moderate, long-term, beneficial impact on terrestrial vegetation and wildlife.
Impacts on Aquatic Vegetation and Marine Life	Implementing alternative 1 would result in minor to major, long-term, adverse impacts on aquatic vegetation and marine life, with long-term major benefits of sand replenishment activities.	Overall, implementing alternative 2 would result in moderate to major, long-term, beneficial impacts on aquatic vegetation and marine life.	Overall, implementing alternative 3 would result in minor to major, long-term, beneficial impacts and a moderate, long-term, adverse impact on aquatic vegetation and marine life.	Implementing alternative 4 would result in minor to major, long-term, beneficial impacts and a moderate, long-term, adverse impact on aquatic vegetation and marine life.
Impacts on Special Status Species	Implementing alternative 1 would not result in any changes to current situations or management that would affect sensitive species.	Implementing alternative would have long-term, minor, adverse impacts on the gopher tortoise at Naval Live Oaks and nesting turtles on East and West Ship islands. Other federally listed species, including Perdido Key beach mouse, sea turtles, birds, and amphibians, will experience negligible or minor adverse impacts in general, but may benefit if certain roads or facilities are closed after a destructive storm. In some locations, additional protec-tions for resources such as permitting of visitor use and seasonal habitat closures will lead to minor long-term benefits to listed species.	Implementing alternative 3 such as Perdido Key beach mouse, sea turtles, shorebirds, and amphibians, would experience negligible to minor adverse impacts. In some locations, additional protections for resources such as restroom construction, permitting of visitor use, and seasonal habitat closures would lead to minor long-term benefits to listed species.	Implementing alternative would have long-term, minor, adverse impacts nesting turtles on East and West Ship islands. Other federally listed species, including Perdido Key beach mouse, sea turtles, birds, and amphibians, experience negligible or minor adverse impacts. However, in some locations, additional protections for resources such as permitting of visitor use and seasonal habitat closures would lead to minor long-term benefits to listed species.
Impacts on Visitor Use and Experience	Overall, impacts on the visitor use and experience from implementing alternative 1 would be minor to moderate, long-term, and adverse.	Overall, impacts on visitor use and experience from implementing alternative 2 would be moderate, long-term, and adverse.	Overall, impacts on the visitor use and experience from implementing alternative 3 would be minor to moderate, long-term, and beneficial.	Overall, impacts on the visitor use and experience from implementing alternative 4 would be moderate, long-term, and beneficial.

Table 4: Summary of Impacts by Topic for Each Alternative

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Impacts on the Social and Economic Environment	. Overall, impacts on the social and economic environment from implementing alternative 1 would be minor, long-term, and adverse.	Overall, impacts on the social and economic environment from implementing alternative 2 would be minor to moderate, long-term, and adverse although increased water transportation and improved fisheries resources would have minor to moderate, long-term, beneficial impacts.	Overall, impacts on the social and economic environment from implementing alternative 3 would be minor to moderate, long-term, and beneficial.	Overall, impacts on the social and economic environment from implementing alternative 4 would be moderate, long term, and beneficial.
Impacts on NPS Operations	Alternative 1 would likely continue to have a long-term, minor to moderate, adverse impact on national seashore operations.	Actions proposed in alternative 2 would be expected to have a long-term, minor to moderate, beneficial impact on national seashore operations.	Actions proposed in alternative 3 would be expected to have a long-term, minor beneficial impact on national seashore operations.	Actions proposed in alternative 4 would be expected to have a long-term, moderate, adverse impact on national seashore operations.

ALTERNATIVES AND MANAGEMENT ACTIONS CONSIDERED BUT DISMISSED

During early phases of the planning process, the planning team drafted several concepts that are slightly different than the alternatives presented in this management plan. One of the early draft ideas focused on putting "preservation first" in light of the NPS Organic Act, including recreational use that supports resource protection. This draft concept would have been to derive national seashore management from the NPS mission.

A second early draft concept focused on "portals of activities". Under this concept, the national seashore would have been managed to educate and inform visitors so they could identify specific themes or activities of interest. These resource themes would have allowed visitors to enjoy a unified or focused experience consistent with their interest.

During the planning process, elements of these early draft concepts were incorporated into the draft alternatives presented in this plan. Many individual elements or actions were recombined between draft alternatives during the Choosing by Advantages process.

AFFECTED ENVIRONMENT

GULF ISLANDS NATIONAL SEASHORE

CHAPTER THREE

INTRODUCTION

This chapter describes the existing environment of Gulf Islands National Seashore. The focus is on elements (natural and cultural resources, visitor opportunities, socioeconomic characteristics, etc.) that would be affected by the actions proposed in the alternatives, should they be implemented. These topics were selected on the basis of federal law, regulations, executive orders, NPS expertise, and concerns expressed by other agencies or members of the public during project scoping.

The first section in this chapter discusses impact topics that are analyzed in detail in this *General Management Plan / Environmental Impact Statement*. The next section discusses impact topics considered but dismissed from further analysis and explains the rationale for these decisions. While these resources or topics are important, the alternatives in this plan either do not have an effect on these resources or they would have only positive impacts on them, and/or any adverse impacts would be negligible to minor.

Impact Topics Analyzed in Detail	Impact Topics Considered but Dismissed
Cultural Resources	Cultural Resources
• *Historic Structures*	• *Archeological Resources (Terrestrial and Marine)* • *Cultural Landscapes* • *Ethnographic Resources* • *Museum Collections*
Natural Resources	Natural Resources
• *Geologic Processes* • *Soils* • *Water Quality* • *Wetlands* • *Terrestrial Vegetation and Wildlife* • *Aquatic Vegetation and Wildlife* • *Special Status Species*	• *Air Quality* • *Ecologically Critical Areas* • *Energy Efficiency and Conservation Potential* • *Natural or Depletable Resource Conservation* • *Prime and Unique Agricultural Lands* • *Soundscapes* • *Water Quantity* • *Floodplains*
Visitor Use and Experience	
Social and Economic Environment	
NPS Operations	
	Other Topics
	• *Environmental Justice* • *Quality of the Built Environment* • *Indian Trust Resources* • *Wilderness Character* • *Carbon Footprint*

DEEPWATER HORIZON, MISSISSIPPI CANYON 252 OIL SPILL INCIDENT

An incident occurred in the recent history of the national seashore that affects its natural and cultural resources. In April 2010 the Deepwater Horizon oil rig exploded and sank, causing fatalities and leaking more than four million barrels of oil into the Gulf of Mexico. The National Park Service is now participating in the largest oil spill response on record. The oil spill will influence cultural and natural resources in the national seashore, and the human uses of this environment as well.

The impacts of the oil spill are unknown. It may take several years to determine what effects have occurred and what resources have been most impacted, or remain at risk because of exposure from the oil either on the land or submerged. To help determine those impacts, or injuries, the National Park Service is participating in a Natural Resource Damage Assessment. The Oil Pollution Act of 1990 authorizes certain federal agencies, states and Indian tribes, collectively known as the Natural Resource Trustees, to evaluate the impacts of the Deepwater Horizon oil spill on natural resources. The Trustees are responsible for pre-assessment data collection, injury assessment, and restoration planning. This process also identifies restoration activities, rehabilitation, or replacement of natural resources, which the responsible parties will be required to fund ₹ to fully compensate the public for the injuries to natural resources caused by the Deepwater Horizon oil spill.

Because of the legal proceedings and the Natural Resource Damage Assessment regarding the potential impacts of the oil spill on the national seashore, an assessment of impacts is not included in this general management plan. However, a brief overview of the oil spill response is included in Chapter 4 as part of the cumulative impact analysis. This approach is taken because of the impact of the spill on national seashore resources (natural and cultural), visitor facilities and experiences, and operations.

The oil spill response has been carried out in both the Mississippi and Florida District s of the national seashore. Initially all of the cleanup efforts were focused in the Florida District, while logistics for access to the Mississippi barrier islands were being developed. The response has been categorized into four phases. Stage 1 was the incident itself, when oil was being discharged from the wellhead and surface skimming and controlled burning of the oil was taking place before it reached land.

Stage 2 is the surficial cleaning or shoreline treatment of oil stranded along the beach face to a depth of between 3-6 inches in depth. This stage of cleanup operations predominantly uses hand-held equipment and some mechanized equipment such as beach sifters to remove oil from the sand. Though Horn and Petit Bois islands contain designated wilderness, a wilderness minimum requirements decision guide was prepared as a step-up plan regarding when the use of mechanized equipment would be condoned and under what conditions to maximize and expedite cleanup efficiency. Stage 2 cleanup of the surface oil (uppermost 6 inches) continues in both the Florida and Mississippi District s of the national seashore, although greater quantities of oil are being recovered from the Mississippi islands, which are oriented closer to the spill site.

Stage 3 is the treatment of buried or subsurface oil. Gulf Islands National Seashore set this limit between 6 inches and 18 inches in the sand. This more intensive or deeper cleaning will only take place on designated recreational beaches. Most of these recreational beaches (5.5 miles out of a total of 5.75 miles) are in Florida. Only one beach on West Ship Island, Mississippi, is designated as a recreational beach. Gulf Islands National Seashore has recommended no further treatment of the natural (nonrecreational) shoreline areas in Florida based on a subsurface survey and resulting profile summary. The national seashore's recommendation for no further treatment of natural shoreline areas in Mississippi is dependent on the outcome of a similar subsurface profile, which has not yet

been completed. "No further treatment" allows for natural attenuation/biodegradation of the remaining oil through natural processes, including wind, wave, weather, and erosion actions. The National Park Service has recommended that whenever buried oil is reexposed by natural processes in quantities greater than Stage 3 no further treatment criteria (more than 1% coverage of the beach area or oiled product greater than 2.5 cm), additional surface cleaning will be implemented according to predefined standards.

Stage 4 will be the maintenance and monitoring and continued short-and long-term assessment of shoreline conditions. Should a future storm cause additional stranding or resurfacing of oil (e.g., from currently undetected submerged sources or oil mats off shore), the National Park Service may adjust its existing treatment measures or prescriptions, as well as reevaluate and rescind any areas that were designated as no further treatment areas.

HISTORICAL OVERVIEW

INTRODUCTION

The history of Gulf Islands National Seashore is distinguished by the unique settings of each of its two districts—the Florida and Mississippi districts. Both districts, while reflecting distinctions, are bound together in a shared history of related events and a common location on the Gulf Coast of the United States.

This discussion of the prehistoric and historic periods of Gulf Islands National Seashore is provided only as a brief summary of the forces and conditions and human actions that have influenced the development of the panhandle region of Florida and the Mississippi islands of the national seashore. These topics have been presented in greater detail elsewhere and should be consulted for further information. Not all the archeological periods or historic activities described below have occurred on what are now national seashore lands. They are provided to understand the broader pressures and influences that molded the area now known as Gulf Islands National Seashore.

PREHISTORY

Paleo-Indian Period, (13,500–11,500 Years before the Present [BP])

The Paleo-Indian period represents the earliest human occupation of the Western Hemisphere. During the last glacial period, large amounts of water were locked up in the ice that covered much of what are now Canada and the northern United States. The resulting drop in ocean levels allowed a land bridge to connect Siberia and Alaska across what is now the Bering Sea. It is believed that after crossing the Bering Land Bridge from Asia, small groups of humans moved southward along an ice-free corridor in western Canada and into the northern Great Plains. Over time, some of the individual groups moved east into the central Mississippi River valley before spreading south and east into what is now Mississippi and Florida.

Little is known about the Paleo-Indian occupation in northwest Florida and coastal Mississippi. Any Paleo-Indian period sites that may be present are likely submerged or buried in the bays and interior floodplains that resulted from the rising ocean levels as the glaciers melted. No Paleo-Indian sites have been identified within the boundaries of the national seashore.

Archaic Period, (11,500–3,000 BP)

As in the Mississippi River drainage, the Archaic period in Mississippi and Florida lasted for about 9,000 years. Part of the slow cultural transformation from the Paleo-Indian period was a change in the subsistence base from the hunting of big game to a more diverse economy based on deer and wild plant foods.

In contrast to the Paleo-Indian lifestyle of highly mobile nomadic bands, the Archaic settlement system used dispersed seasonal base camps and short-term satellite special-use camps. There is also limited evidence that early agriculture began in the late Archaic Period. As the Archaic Period continued, the use of centralized base camps continued to grow and become longer lasting, with the smaller satellite camps continuing.

In the Florida panhandle, there may have been a more decided change from a dispersed settlement pattern to one exhibiting an even greater sedentary existence than elsewhere (Bense 1994). As with the Paleo-Indian Period, no Archaic Period sites have been found within the national seashore.

Woodland Period (3,000 BP–1,000 BP)

By the end of the late Archaic, the environment in the Southeast was changing from a hot dry climate to a cooler and wetter one. In addition, the sea level was also beginning to stabilize because the ice sheets had finally melted.

With an increase in the number of dense village middens, and a greater reliance on marine resources —suggested by the increasing levels of the remains of aquatic fauna—it is generally believed that population continued to increase. In both northern Florida and southern Georgia and Mississippi, the Woodland Period's lifestyle can also be demonstrated by increased use of the resources in the river valleys and along the coast and a continuing base camp–satellite camp settlement pattern.

In Mississippi, a transition from the Poverty Point phase of the Archaic Period to the Woodland Period began to develop; this period was characterized by a highly developed social and political organization. Large shell middens along the coast representing lowland base camps, sometimes in the shape of horseshoes and rings, are present. The Middle Woodland culture in northwest Florida appears to be the product of a blend of influences—Marksville, from the lower Mississippi Valley; Hopewell, from the Ohio Valley; and a complicated tradition pattern from the Georgia area.

Most of the prehistoric archeological sites within the boundaries of the national seashore in both the Florida and Mississippi districts have been identified as Woodland Period sites. These sites are scattered throughout the national seashore, but have been most thoroughly documented in the Naval Live Oaks Area where Woodland middens are characteristically found.

Mississippian Period (1,450 BP–500 BP)

The Mississippian Period was the final prehistoric period of aboriginal culture throughout the Southeast. In northwest Florida and coastal Mississippi, the Woodland settlement and subsistence patterns continued into the Mississippian Period. In most respects, the coastal Mississippian subsistence strategy was based on hunting, gathering, and fishing. However, the typical subsistence base of the inland Mississippian peoples was mainly based on growing maize, beans, and squash. Agriculture is not considered to have been as important on the coast as in the river valleys.

The first evidence of the Mississippian Period dates to about 1,450 BP–500 BP. Continuing a process begun in the Woodland Period settlements, Mississippian settlements (often located on hammocks) continued to grow, both through overall population increase and accretion of smaller satellite camps. Burial mounds have also been identified with these early sites, although no known mounds have been identified in the national seashore.

During the next 1,500 years these early Mississippians peoples changed and adapted to the region. Broad, long-distance trade networks developed through the middle part of the period. Mississippian peoples developed complex chiefdoms and a redistributive tribute system—generally with fewer but larger ceremonial sites than in the Archaic or Woodland periods. The larger settlements, still surrounded by many smaller satellite camps and often in a variety of coastal and upland environments, exhibited far-ranging socioreligious unification.

After the late 15th century, it is necessary to speak of historic Indians with the Mississippian cultures declining at the time of European contact. Some Mississippian sites have been identified within the limits of the national seashore, but their numbers are significantly smaller than the earlier Woodland Period sites. Several Mississippian Period sites have been tentatively identified in the national seashore, primarily as seasonal and short-term camps. However, the affiliation of these sites is based on limited collections of artifacts and is open to reinterpretation after further investigation.

HISTORIC PERIOD

Although it is unclear who the first European was that entered Pensacola Bay, it was probably a member of the Alonso Alverez de Pineda expedition. In 1519, the Spanish governor of Jamaica sent him to explore the Gulf of Mexico from Florida to the central coast of Mexico. Almost certainly members of his expedition would have found and explored the bay. In 1528, Panfilo de Narvaez, a Spanish explorer and conquistador, led an expedition of 250 to 300 men, including one Cabeza de Vaca. De Vaca's narrative of this expedition, *La Relación,* offers a remarkable first description of the northwest Florida native peoples.

Although other Europeans likely visited the area, it was not until 1559 that the Pensacola Bay area was colonized by the Spanish. In August of that year, Tristan de Luna y Arellano was appointed the viceroy of New Spain and charged with establishing a settlement at Pensacola. However, on August 19, 1559, shortly after landing the fleet at Pensacola Bay, a hurricane grounded or sank every ship. The exact location of the Luna settlement is not known, but it is believed to lie within the modern Pensacola Naval Air Station. Underwater investigations in Pensacola Bay have revealed the location of a 16th century shipwreck that may be associated with the Luna expedition.

Although much of the early settlement activity of the Gulf Coast occurred in the waters in and surrounding Pensacola Bay, in 1682 Frenchman Robert Cavelier Sieur de La Salle descended the Mississippi River and claimed the entire region drained by the river, which he named Louisiana in honor of Louis XIV of France. He then turned around, ascended the river, and returned to France. LaSalle soon returned looking for the mouth of the Mississippi but missed his intended location and in 1685 settled in Matagorda Bay, far to the west in Texas.

To stop the push for settlement by the French as well as the British, Juan Eriquez Barrota was empowered in 1685 by Spain to explore the Gulf of Mexico coast and to locate and destroy intruders into the Spanish areas. Eleven expeditions were sent to find La Salle. Three of these expeditions were commanded by Capt. Andres de Pez of Barrota's expedition, but de Pez never found La Salle. However, de Pez did come to believe that a colony should be established at Pensacola. As a result of a royal decree in 1692, the Spanish king authorized de Pez to explore Pensacola and Mobile bays and other areas to the west to see if the establishment of a colony could be supported.

Four years and two proclamations later, Andres de Arriola left Veracruz, Mexico, and set out for Pensacola Bay via Havana, Cuba. At the same time, Captain Juan Jordan de Reina hurried from Spain to Havana where he obtained troops and supplies and set sail for Pensacola Bay. Surprisingly, de Reina missed meeting de Arriola in Havana and arrived at the bay only four days before de Arriola. Already de Reina had begun to construct a fort of pine logs and sand on a red clay bluff on the mainland. The fort, named San Carlos de Austria, is recorded as a quadrilateral structure with bastioned corners; it was near the site of the later American-built Fort Barrancas.

In 1697 Canadian Pierre LeMoyne d'Iberville, was chosen to pick up where La Salle left off and to establish a French colony at the mouth of the Mississippi River. On January 25, 1699, Iberville found two ships at anchor in Pensacola Bay off the newly established Spanish fort. Arriola refused to allow the Frenchmen to enter the bay. After determining that the settlement was Spanish, d'Iberville sailed further west and continued to search for the Mississippi River. On February 10, 1699, d'Iberville dropped anchor in what is now Mobile Bay and began to explore Dauphine, Petit Bois, Horn, and Ship islands.

For the following almost 100 years the French and Spanish vied for control of Pensacola Bay. Much of the back-and-forth was driven by the desire for empire in the New World. In 1722 the Spanish had wrested control of the bay back from the French, and they built a small fortification, San Miguel, on the mainland to

protect Christianized Indians. Despite several severe storms (likely hurricanes), this small settlement foretold the permanence of Pensacola. By the 1760s the English and Spanish were again at war. The resulting 1763 Treaty of Paris reshaped the American continent, and the Spanish ceded all their possessions east of the Mississippi to the British. The British immediately began work on an old stockade of San Miguel, renamed it the Fort of Pensacola, and worked on the defenses around the bay.

The Spanish were never content with their loss of territory and declared war on the British in 1779. Yet it was not until 1781 that the Spanish forces finally ousted the English from Pensacola. The royal redoubt built by the British on the barrancas (banks) was in extremely poor shape, but it was repaired and renamed Fort San Carlos de Barrancas.

In December 1794 the American Congress had authorized the establishment of the second American Navy and directed President George Washington to construct six frigates for this purpose using the best possible live oak and red cedar timber. As early as 1817, the need for a reliable source of live oaks was realized. The resulting "An Act Making Reservation of Certain Lands to Supply Timber for Naval Purposes" was signed into law by President James Madison in 1821. In 1825, soon after John Quincy Adams took office, the new secretary of the Navy, Samuel Southard, recommended "a preservation program to conserve a future supply of live oaks for the use of the navy." In 1827 Congress agreed to the secretary's request to form live oak preserves. But the lack of a land survey derailed the creation of the preserves until 1828 when the United States purchased the land that comprises the current Naval Live Oaks Area. Although the pine forests were exploited during the British period, the Second Spanish period (1781–1821) witnessed an increase in milling activity as timber became an even more important resource.

After several American occupations, continuing through the War of 1812, western Florida was formally ceded to the United States by Spain in 1821. Shortly thereafter a campaign was launched to strengthen the nation's costal defenses as part of the U. S. coastal defense system. Beginning in 1829, construction of three forts was begun. Battery San Antonio was built on the remnants of the Spanish Fort San Carlos de Barrancas and modified to strengthen the fort's position. Forts McRee and Pickens were added. With these three forts functioning together, the entrance to Pensacola Bay could be guarded by covering crossfire. These forts were constructed using slave labor and other laborers.

Ship Island was designated a military reserve in 1847. In 1858 work commenced on a fort on the island, but it was not completed until after the Civil War. The fort was only partially finished when the Mississippi State Militia seized the structure in 1861 at the outbreak of the Civil War. But because the Confederate troops had no cannon, it was a relatively simple matter for them to be driven out by the Union ship, the USS *Massachusetts*. When the Union forces landed and reoccupied the fort, they may have named it after their ship. With Ship Island once again under federal control, its use was changed to that of a prison camp for both prisoners of war and sympathizers to the Confederate cause. After the war, Ship Island continued to serve as a federal prison until it was decommissioned in 1870. From 1878 until 1905, Ship Island continued to be used by the federal government—this time as a quarantine station during an influx of yellow fever brought to the United States by immigrants.

On the island of Santa Rosa at the entrance to Pensacola Bay, the federal garrison at Fort Pickens refused to surrender to the Confederacy. It proved to be one of the few Southern fortifications held by the Union for the duration of the war. However, by early 1862, with more strategic regions of the South in peril from Union advances, Pensacola was abandoned by the Confederacy. By 1865 the thick masonry walls of Fort Pickens were obsolete. Rifled artillery and armored warships called for more elaborate defenses than the fort had been designed for.

In 1885 a concern grew regarding the condition of the nation's defenses. President Grover Cleveland established a board headed by Secretary of War William C. Endicott to review the situation. The board's recommendation established a new period of armament construction from 1890–1910.

Five reinforced concrete fortifications were built in the Fort Pickens Area between 1897 and 1899, and a minefield was prepared for the harbor entrance. Smaller and faster minesweepers and torpedo boats designed to penetrate minefields led to the development of rapid-firing cannon. In response to these technological changes, three batteries were built between 1898 and 1905 at Fort Pickens. Although all of the artillery pieces have been removed from these batteries, the massive reinforced concrete structures that were protected by large earthen embankments remain.

The extensive use of artillery during World War I led to many improvements that were incorporated into Battery Langdon, the most powerful emplacement to be built at Fort Pickens. The quickening pace of technological evolution finally overwhelmed the coastal defenses during World War II. The forts could not stop an attack from an ocean-going enemy. All the remaining artillery pieces were scrapped, and after 118 years of service Fort Pickens was closed in 1947. When the U. S. Army pulled out of the fort, they recycled most of the metal they had used, including the remaining cannon. All that is left today is Tower 234.

Immediately before the War II and following its end, what was to become the Gulf Islands National Seashore became the center of a local movement to preserve its natural and historic heritage. Having been a Florida state park and considered for development as a national monument in 1939 because of the Pensacola forts and its stunning natural beauty, intensive organizing by the local public resulted in the congressional establishment of Gulf Islands National Seashore on January 8, 1971.

CULTURAL RESOURCE TOPICS CONSIDERED AND ANALYZED IN DETAIL

The National Park Service's *Management Policies 2006* categorizes cultural resources as archeological resources, cultural landscapes, ethnographic resources, prehistoric/historic structures, and museum collections. Archeological resources, cultural landscapes, ethnographic resources, and museum collections have not been analyzed in detail in this document because they would not be affected under any alternative; these categories are described in the "Impact Topics Dismissed" section later in this chapter.

HISTORIC STRUCTURES

Introduction

A historic structure is a constructed work consciously created to serve some human activity. Historic structures are usually immovable, although some have been relocated and others are mobile by design. They include buildings and monuments, dams, millraces and canals, nautical vessels, bridges, tunnels and roads, railroad locomotives, rolling stock and track, stockades and fences, defensive works, temple mounds and kivas, ruins of all structural types, and outdoor sculpture.

Park resources classified as historic structures may be listed as buildings, structures, districts, or objects in the National Register of Historic Places. Nominations for the National Register may be prepared either for individual structures or for groups of structures. Collective nominations are appropriate for structures that are physically related, as in a historic district. Historic structures also may be included in the National Register as contributing elements of historic districts, either as components of developed areas or as landscape features. All historic properties in Gulf Islands National Seashore have been or will be surveyed and evaluated by the NPS for eligibility for the National Register. Currently, three structures or groupings of structures have been listed on the National Register. The following table identifies the National-Register-listed historic structures in the national seashore.

TABLE 5: NATIONAL-REGISTER-LISTED PROPERTIES AT THE NATIONAL SEASHORE

District	County	Property	Location	Date of National Register Listing
Florida	Escambia	Fort Barrancas Historic District	U.S. Naval Air Station	1966
Florida	Escambia	Fort Pickens	FL 399, west of Pensacola Beach	1972
Mississippi	Harrison	Fort Massachusetts	South of Gulfport on Ship Island, in the national seashore	1971

List of Classified Structures

The List of Classified Structures is a computerized, evaluated inventory of all historic/prehistoric structures with historical, architectural, or engineering significance in which the National Park Service has a legal interest or plans to acquire legal interest. Included in the list are buildings and structures that individually meet the criteria of the National Register of Historic Places (National Register) or that are contributing resources of sites and districts that meet National Register criteria.

Because this list is an inventory of all historic structures throughout the national seashore, the various structures may be individually listed in the National Register or as a constituent component of a historic district.

The national seashore's List of Classified Structures provides the primary reference of building types, significance, condition, and recommended treatments. The national seashore has 62 structures on this list. Primary among those treated as eligible for listing in the National Register are those associated with the military including forts, batteries, or command structures located in the Florida units. Several other buildings, such as Civilian Conservation Corps (CCC) era (1933-1942) cabins are at Davis Bayou Area.

Forts on the National Register of Historic Places

Fort Barrancas National Historic District. The Fort Barrancas National Historic District is located on 64 acres of the Pensacola Naval Air Station and consists of three structures—Fort Barrancas, Battery San Antonio, and the Advanced Redoubt of Fort Barrancas.

Fort Barrancas is a National Historic Landmark; the highest historical designation a historic structure can be given. It is one of the four forts built for the defense of Pensacola Bay and the Navy yard. Built between 1839 and 1844, this fort is near the top of the bluff overlooking the entrance to Pensacola Bay.

Battery San Antonio (Water Battery of Fort Barrancas) was built by the Spanish below Fort Barrancas in 1797–98 and is known as the Water Battery. Originally named the Bateria de San Antonio, it is essentially a small, self-contained fort, although it is accessible through an underground passage from Fort Barrancas above it.

The Advanced Redoubt of Fort Barrancas is one of the four forts built by the United States to protect Pensacola Bay and the Navy yard. It is unlike the other fortifications because it is designed exclusively to defend against a land assault. The Advanced Redoubt is about 500 yards across the peninsula, close to the Bayou Grande. The Advanced Redoubt provided a line of resistance across the whole peninsula.

Fort Barrancas and the nearby Advanced Redoubt were extensively restored in 1975–1979.

There are three other sites within the district—(1) the Fort Barrancas borrow pit, which may have served as an area of encampment during the Civil War, (2) a concentration of 1818 period artifacts, and (3) the remains of a ditch that fronted an earthwork constructed between Fort Barrancas and Advanced Redoubt between 1863 and 1864. Both the borrow pit and the concentration of artifacts are recorded as archeological sites.

The Fort Barrancas Historic National District is of great significance because it represents coastal defense of the Pensacola area from 1796, when Battery San Antonio was built, until after the Civil War, when all three fortifications were active as first Confederate and then Union outposts.

Fort Massachusetts. Fort Massachusetts is listed on the National Register because of its history in the defensive network of fortifications of the gulf coast. Fort Massachusetts is on Ship Island, about 13 miles south of Gulfport, Mississippi. This fort is of brick masonry. Constructed between 1859 and 1866 (construction continued during the Civil

War), this fort was sold to the American Legion in 1936.

Fort Pickens. Listed on the National Register because of its importance in the history in the defense of Pensacola Bay, Fort Pickens is on the western end of Santa Rosa Island at Point Siguenza and is one of the four forts built by the U.S. for the defense of Pensacola Bay and the Navy yard. Fort Pickens was a massive and complex project, using more than 21.5 million bricks. When the fort was originally completed in 1835, it was 500 feet from the water, but the accretion of sand on the west end of the spit has left the fort more than 4000 feet from the water. Both 11-inch and 15-inch guns were mounted to command the entrance channel into Pensacola Bay.

Artillery Batteries

During the late 1890s and early 1900s, new gun batteries were constructed at Fort Pickens. These batteries were part of a program initiated by the Endicott Board. The Endicott batteries used a system of dispersal and concealment for protection from naval gunfire, which was more accurate and powerful than in the past.

Battery Pensacola. Battery Pensacola is within Fort Pickens. Construction was started in 1898 and completed in 1899. The position of the battery illustrates the evolution of coastal defenses from brick and stone fortifications to the modern reinforced concrete installations. The two 12-inch guns mounted on disappearing carriages in the perimeter of Fort Pickens were removed in 1934, and the carriages were removed in 1942.

Battery 233. Battery 233 is near the site of the now destroyed Fort McRee on Foster's Bank. Constructed in 1942-43, the battery was intended to hold two 6-inch shield guns. The carriages were mounted, but the guns were never installed.

Battery 234 (Brown). On Santa Rosa Island west of Battery Cooper, Battery 234 was constructed in 1942–43 as a long-range gun battery. The battery was designed to consist of two guns, with a central traverse "magazine" that held ammunition, generators, the plotting station, and other facilities. A steel tower contained the battery commander's station on the lower level. The upper level housed a coincidence range finder. In 1976, two 6-inch shield guns were provided to the National Park Service by the Smithsonian Institution, which are now mounted at Battery 234.

Battery Cooper. The battery is east of Fort Pickens on the south side of the island and is one of the few Endicott period weapons remaining in its battery. A frontal view of one of these disappearing batteries with the gun in loading position resembles the surrounding sand dunes. During World War I, the guns were removed for use on railway mounts in France. The disappearing carriages were kept until 1920, declared obsolete, and salvaged. In 1937, four emplacements for 155-mm guns were constructed around Battery Cooper, and these emplacements were designated Battery GPF, remaining part of the Harbor Defense Project until the spring of 1945 when it was disarmed. After the establishment of the national seashore, the 6-inch gun mounted on a disappearing carriage was reinstalled as an exhibit.

Battery Center. On Foster's Bank, northeast of Battery Slemmer, construction of this battery was completed in 1901. Its four 15-pounder rapid-fire guns were declared surplus and removed in 1920.

Battery Langdon. Battery Langdon is near Fort Pickens, east of the current concession store. Construction started in 1917 and was completed 1923. The original battery had open gun emplacements and was designed to consist of two guns, with a central traverse "magazine" that held ammunition, generators, the plotting station, and other facilities. The gun emplacements were enclosed in a concrete case-mate. The two 12-inch guns were located about 500 feet apart, with the magazine, generator rooms, and other facilities related to the function of the battery

in between the batteries and under a dune. Declared surplus in 1947, the guns and carriages were scrapped.

Battery Payne. Located on the southwest tip of Santa Rosa Island, the battery was constructed in 1904 and disarmed in 1946. The design and mission of this battery was identical to Battery Trueman and had two 3-inch guns mounted on pedestal carriages.

Battery Slemmer. This battery is on Foster's Bank, northwest of the site of Fort McRee. Construction was completed in 1899, and two 8-inch guns mounted on disappearing carriages were installed. In 1917, the guns were removed and shipped to Europe for mounting on railroad cars. The carriages were scrapped in 1920.

Batteries Cullum and Sevier. Although this one large complex, in 1915 the west half was redesignated Battery Sevier. Completed by 1898, the complex housed four 10-inch rifles on disappearing carriages.

Battery Trueman. Positioned on the northwest tip of Santa Rosa Island, north of the harbor entrance, construction of the battery was started and completed in 1905. The two 3-inch guns mounted on pedestal carriages were relocated to Battery Cullum in 1943. The battery was disarmed in 1946.

Battery Van Swearingen. Located adjacent to Battery Cullum, construction started and was completed in 1898. Two 4.7-inch guns were mounted on pedestal carriages. The guns and carriages were removed in 1921.

Battery Worth. Battery Worth is east of Fort Pickens, close to the current road. Construction was completed in 1899, and the battery had eight 12-inch mortars. In 1918 four of the mortars were removed. In 1942 this battery was declared obsolete, and the remaining guns and carriages were removed. Later the structure was renovated and used for the Harbor Defense command post. The command post is the structure on top of the battery.

Additional Buildings and Structures in the Fort Pickens Area

Structures in the Fort Pickens Area were constructed at various times throughout the 20th century. In most cases these structures are now serving a different use than historically intended.

TABLE 6: ADDITIONAL BUILDINGS AND STRUCTURES IN THE FORT PICKENS AREA

Structure Name	Current Use	Historic Use	Composition/ Building Type	Construction Date
Building 1	Quarters/office	NCO Quarters	1-story wood frame duplex	1909
Building 2	Quarters	Officer's Quarters	1 1/2-story wood frame	1900
Building 3	Office/storage	Officer's Quarters	1 1/2-story wood frame	1900
Building 4	Quarters/conference	Officer's Quarters	2-story wood frame	1912
Building 5	Offices/museum/ auditorium	Dormitory/mess and kitchen/ PX/administration	1-story wood frame	1900
Building 6	Concession/restrooms	Fire station	1-story wood frame	ca. 1940

Structure Name	Current Use	Historic Use	Composition/ Building Type	Construction Date
Building 7	Quarters	NCO Quarters	2-story wood frame/duplex	1900
Building 8	Quarters	NCO Quarters	2-story wood frame/duplex	1910
Mining Casemate	Workroom/storage/ restrooms	Mining casemate	Brick	ca. 1904
Pump House	Paint shop	Pump house	1-story wood frame	ca.1940
Pumping Plant	Maintenance field office	Pumping plant	Brick	1920
Pipe Shop	Museum storage	Ordinance machine shop/ transformer house	Concrete	ca. 1900
N/A	Main pump house	N/A	Wood frame	1973
N/A	Auxiliary pump house	N/A	Wood frame	1974
Mine Loading Room	Maintenance shop	Mine loading room	Brick	1907
Mine Storeroom	Maintenance warehouse	Mine storeroom	Brick	1901
Warehouse	Maintenance and museum storage	Engineer tool house/ storehouse	Concrete	ca. 1900
Comfort Station, Battery Van Swearingen	Restrooms	Latrine	Wood frame	ca. 1940

Miscellaneous Structures

Four additional historic structures not associated with the military are present in the national seashore.

Fort Pickens Ranger Station. This structure, also known as the Lifesaving Station, is within the Fort Pickens National Register boundary and is a 2-story, side gable building with concrete pier foundation and shingle siding. There are three gable dormers, and a hipped wrap-around porch with square posts. The original garage doors on the west have been replaced with windows. A shed roof porch that faces the coast has been enclosed.

The garage is a 1-1/2 story, front gable building with a shed roof addition. The original garage doors on the west side of the building have been replaced with windows, while the shed roof porch on south side has been enclosed.

Civilian Conservation Corps Buildings #1 and #2. The national seashore has relatively little information on the early history of these buildings The CCC cabins at Davis Bayou are eligible for listing in the National Register under criterion A for their association with state park development in Mississippi by the Civilian Conservation Corps. They appear to be constructed of stone in the rustic style. Originally these buildings were used as housing, either as a single-family dwelling or more likely as bunkhouse structures. Although generally the same in layout and design (1-story, flat roof buildings with concrete pier foundations and a central doors), the buildings are slightly different sizes. They were most recently rehabilitated

(before Hurricanes Ivan and Katrina struck) for use as housing for temporary and seasonal employees. This latest rehabilitation—among what is believed to be several earlier rehabilitation efforts—has removed much of the original interior fabric of the buildings, leaving only the exterior to reflect their earlier use.

The coastal fortifications and historic batteries at Gulf Islands National Seashore may be especially vulnerable to increased severe weather that is anticipated in the future due to climate change (Loehman and Anderson 2009). For example, natural wave action and storm surge are causing erosion around the foundation of Fort Massachusetts. Sea level rise and an expected increase in severe weather and precipitation may increase the rate of erosion around this structure and others like it. Additional undiscovered historic sites may be uncovered or exposed to the elements during storms or floods. Coastal fortifications and other historic structures such as the Fort Pickens Ranger Station may also be vulnerable to damage from changes in the freeze/thaw cycle stage that can affect the fabric of the structures and their foundations.

TABLE 7: MISCELLANEOUS STRUCTURES

Structure Name	Current Use	Historic Use	Composition / Building Type	Construction Date
Ranger Station	Ranger station	Fort Pickens Ranger Station / Coast Guard Station	2-story wood frame	ca. 1908
Ranger Station Garage	Garage and equipment building	Coast Guard equipment	Wood frame	1939
CCC Cabin #1	Vacant (not in use)	Institutional housing	Masonry	1938–41
CCC Cabin #2	Dormitory (bunkhouse)	Single-family dwelling	Masonry	1938–41

GEOLOGICAL PROCESSES

Gulf Islands National Seashore is located in the Northern Gulf of Mexico, stretching east to west roughly between the Destin East Pass of the Choctawhatchee Bay in Northwest Florida and the end of the Saint Bernard Delta of the Mississippi River, located in adjacent Louisiana. The Florida portion of Gulf Islands includes the barrier islands of Santa Rosa Island and Perdido Key and mainland sections at the Naval Live Oaks reservation and the land supporting three historic forts located within the Pensacola Naval Air Station. In Mississippi, Gulf Islands National Seashore includes the islands of Petit Bois, Horn, East Ship, West Ship and portions of Cat Island as well as a portion of Davis Bayou on the mainland. Dauphin Island in Alabama is in the middle of the national seashore is the only island not included in this otherwise continuous chain of northern Gulf Coast barrier islands that stretch unbroken for over 160 miles.

Santa Rosa Island

The general scientific consensus for the evolution of Santa Rosa Island is that the barrier island emerged from an elongated shoal 4,000–3,500 years ago and has apparently kept pace with slowly rising sea level since then (Otvos 2005a, b). This late Holocene, sandy nearshore shoal was attached to a "Pleistocene core" around which the island's eastern and western shoal platform may have subsequently developed. The narrow Pleistocene core, located under the middle sector of Santa Rosa Island, probably consisted of barrier ridge sands of the Gulfport Formation. In the subsurface, younger Holocene nearshore sands veneer the late Pleistocene deposits of the Gulfport Formation and the underlying Biloxi Formation; recent beach and dune sands make up the surficial deposits. The "composite nature" of Santa Rosa Island with its Pleistocene "core" and Holocene "veneer" facilitated stabilization and further longshore propagation of the island (Otvos 1982a). Holocene Santa Rosa Island lies in continuation of and receives littoral drift from the late Pleistocene Destin headland east of Destin East Pass. Nearly the entire island undergoes extensive overwash during hurricanes.

Landward of Santa Rosa Island, the coastal plain surface is underlain by a wide belt of mostly fluvial, late Pliocene sediments of the Citronelle Formation. At several northwestern Florida and southeastern Alabama locations, Citronelle deposits include inter-layered estuarine lenses (Otvos 1997, 2005d). Sediment cores revealed no readily recognizable Citronelle Formation deposits beneath Santa Rosa Island itself, however. The stratigraphic units that underlie Santa Rosa Island include alluvial and brackish, locally marine sands and muds, which are part of a thick late Miocene to early Pliocene sediment sequence. Earlier publications referred to these sediments as the "Pascagoula" and overlying "Graham Ferry" formations in Mississippi and Alabama. However, these terms are probably obsolete because the formation boundaries are still not well established in the subsurface (Otvos 1994, 1997; Ervin Otvos, University of Southern Mississippi, written communication, February 28, 2007).

When sea level was lower and climate was drier during the late Pleistocene Wisconsin glacial stage, eolian processes formed dunes and sand sheets from reworked sands of older (perhaps Gulfport Formation) deposits. These dunes and sand sheets cover the Gulfport Formation in the adjacent Florida and southeastern Alabama mainland areas, including the headquarters area of Gulf Islands National Seashore at Gulf Breeze, Florida (Otvos 2004).

Mississippi–Alabama Barrier Islands

The Mississippi–Alabama barrier chain is underlain by the same Miocene to late Pleistocene sedimentary sequence as under Santa Rosa Island. As in Florida, the barrier islands in Mississippi formed from shoals (Otvos 1979, 1997, 2005c) about 5,700–5,000 years ago when sea level was lower than present by approximately 3 to 5 feet (1.0–1.5 m) (Otvos and Giardino 2004; Otvos 2005a, c, d). The Mississippi–Alabama island chain formed against a background of decelerating sea-level rise during the late Holocene. At this time, eastern Dauphin Island represented an isolated "high ground" and in continuation with the huge Mobile Pass ebb-tidal delta became the pathway for westward transmission of extensive volumes of littoral sand. Drill holes encountered the Biloxi Formation and probably also the Prairie formations under the barrier islands. These formations also occur beneath the adjacent Mississippi, Alabama, and northwestern Florida mainland coastal plain. The high eastern Dauphin Island sector is underlain by a Pleistocene core composed of barrier ridge sands of the Gulfport Formation, which are underlain by the Biloxi Formation (Otvos 1982a, 1982b; Otvos and Giardino 2004). Late Holocene nearshore marine sands surround this core. Recent beach and dune deposits top the sequence.

Eastern Dauphin Island captured and forwarded large volumes of sand from the Mobile Bay ebb-tidal currents and from the mainland shores of northwestern Florida and southeastern Alabama via westward directed littoral drift. The Alabama-Louisiana chain emerged following the isolation of a lagoon of the Mississippi Sound and developed on a series of long, shallow shoal platforms that accumulated parallel to the mainland (Otvos 1979; Otvos and Giardino 2004).

Between 4,000 and 3,500 years ago, a lobe of the St. Bernard delta of the Mississippi River retreated into the area west of the Mississippi barrier islands, resulting in mainland extension, shoaling, and marsh development. As a result, the western Mississippi and southeastern Louisiana members of the barrier-island chain west of Cat Island became stranded in the emerging marshlands. By about 2,400 years ago, the sediments from a greatly expanding younger St. Bernard delta lobe created shoals as far west as Ship Island. Diminishing the impact of the Gulf wave regime, these shoals had interrupted westward-directed littoral drift, and Cat Island became stranded by shoal development. With the sand supply from the islands in the east cut off, the eastern end of Cat Island started to erode. At the same time, shore erosion, combined with continuing tectonic subsidence in the adjacent eastern marginal zone of the Holocene Mississippi delta complex, had eliminated the oldest ridge sets in northern Cat Island (Otvos 1979; Otvos and Giardino 2004).

With the exception of Cat Island, where the influence of delta subsidence has been impacting that island, the barriers in the Mississippi–Alabama island chain kept pace with rising sea level during the Holocene. Nevertheless, the erosive history and rate of area losses of the island chain may suggest a relatively short life expectancy for at least some of the barrier islands, for example East Ship (Otvos and Giardino 2004; Otvos and Carter 2008). Episodic hurricane destruction and island segmentation has played an essential role in the evolution of all the Mississippi–Alabama barrier islands (Otvos 1979) and will continue to do so. At its peak, Hurricane Katrina (2005) completely submerged the entire barrier island chain, segmenting several islands and reducing their size.

French and British charts from the 18th century indicate that Dauphin and Petit Bois islands once formed a single entity (Isle Dauphin) (Otvos 1979). The oldest (eastern) part of Petit Bois Island formed the western sector of Dauphin Island at that time. After Petit Bois and Dauphin islands became separated, Petit Bois lost most of its long, narrow eastern sector apparently during a single (1916) major hurricane (Otvos and Carter 2008). Widening to a record 5.3 miles (8.5 kilometers) by 1957, Petit Bois Pass now partially overlaps the former Dauphin Island

area. Since the 1850s, Petit Bois has retreated westward in downdrift direction (Otvos 1979). Although the island advanced approximately 3.1 miles (5.0 kilometers) westward between 1850 and 1974, its 9.6-mile- (15.5 kilometer-) long eastern sector reverted to a shoal platform.

Another example of periodic erosion and aggradation is the Isle of Caprice, which was part of the Dog Keys. Isle of Caprice existed intermittently between Horn and Ship islands from 1848 to 1940 and was probably cut in two by a hurricane in July 1916 (Otvos 1979). Ship Island has been repeatedly split into West Ship and East Ship islands since the mid-19th century, for instance, during a cyclone (1947) and Hurricanes Betsy (1965) and Camille (1969) (Falls 2001; Otvos and Carter 2008). Chart and survey data document a reduction in area of Ship, Horn, and Petit Bois islands by 26% in 150 years, declining from a combined surface area of 15.5 square miles (40.2 square kilometers) in 1850 to 11.5 square miles (29.7 square kilometers) in 2000 (Otvos and Giardino 2004).

Climate change is expected to accelerate the natural barrier island processes at Gulf Island National Seashore. Opposing forces of coastal erosion and sand accretion are ongoing on the barrier islands, though they have been altered to some degree in the past by dredging operations, beach replenishment, and changes in the amount of sediment moving within the Mississippi Sound and Gulf of Mexico waters (Morton 2008). Hurricanes and major storms can cause dramatic changes to the rate of erosion and accretion on the national seashore barrier islands. One study found that over a 140 year period before the hurricanes of 2004 and 2005, average shoreline erosion rates in the Fort Pickens and Santa Rosa Areas of the national seashore were -2.3 feet per year and -0.33 feet per year, respectively. In the two year period including five hurricanes from September 2004 to September 2005, shoreline erosion rates in these areas averaged -230 feet per year (Hapke and Christiano 2007). These dramatic shoreline changes are not indicative of the entire 140-year study period, but serve as an example of the potential of severe storms to have substantial impacts. Climate change may increase the frequency and intensity of severe weather along the Gulf Coast, which may alter the rate of erosion on national seashore barrier islands (Ning et al. 2003).

SOILS

Soil is produced by forces of weathering and soil formation acting on parent material. Five major factors are responsible for the development of soil in any given area. These five factors are the physical and mineral composition of the parent material; the climate under which the soil material has accumulated and existed since accumulation; the plant and animal life on and in the soil; the relief, or lay of the land; and the length of time that these factors have acted on the soil material (Jenny 1941, 1980).

All of these factors are interdependent in that each modifies the effect of the others, but the relative importance of each factor differs from place to place. The effect of the parent material is modified greatly in some places by the effects of climate, relief, plants, animals, and relative water table. The interrelationship among the five factors is complex, and the effects of any one factor cannot be isolated and completely ascertained. A difference in any of the factors results in a different soil. The soils at Gulf Islands National Seashore can by typified as greatly weathered and leached, with little organic material, low natural fertility, and high acidity.

The parent material of Gulf Islands National Seashore is mostly marine in origin but also to a lesser degree was deposited and formed in alluvial outwash as part of larger, ancient deltaic plains. Beaches were deposited by the action of tides, waves, and currents of the Gulf of Mexico. Most of the soils are geologically relatively young in age formed during the Late Pleistocene and Holocene epochs, 11,000 years ago until the present day. The islands today were covered a number of times during the Pleistocene Epoch. Deposits are mostly quartz sand with varying amounts of clay, silt,

and shell fragments, depending on the location. Island and shoreline ridge deposits are largely devoid of clay and silt because these sand formations were deposited by wind after ocean currents transported the parent material. For example, Santa Rosa Island is composed of approximately 99% medium-grained quartz sand. Where a considerable amount of plant material accumulates and decay is limited by too much water, organic material, or muck, gradually develops. Soils that formed in organic materials are in tidal marshes at low elevations adjoining brackish water. These soils are still forming as the grassy vegetation and wetland plant material accumulates and slowly decomposes, such as in Davis Bayou, although these mucky deposits are not restricted to any certain area.

The climate of Gulf Islands National Seashore is warm and humid characterized by long hot summers and mild winters. This climate has been similar throughout most of the period of soil formation. Rainfall and temperature are the major factors of climate that influence soil formation. Warm temperatures and abundant rainfall (up to 65 inches per year) accelerate the growth of many kinds of organisms and the rate of chemical reactions. Because the rainfall generally is well distributed, most soils retain moisture throughout the year. These conditions are favorable for the rapid decomposition of organic material and hasten chemical reactions in the soil. The relatively high amount of rainfall leaches the soluble bases, plant nutrients, and the less soluble colloidal material downward through the soil profile.

Plants, animals, and other microorganisms that live on and in the soil have a significant role in soil formation. Plant and animal life can increase the content of organic matter and nitrogen, increase or decrease plant nutrients and change the structure and porosity of the soils. Plants recycle nutrients, supply and accumulate organic matter, transfer minerals from the subsoil to the surface layer and provide food and cover for animal life. They stabilize the surface layer so that soil-forming processes can continue. Plants also stabilize the environment for soil-forming processes by protecting the soil from extremes in temperature, thereby providing a more stable soil microclimate.

The soils at Gulf Islands National Seashore have formed under a succession of plants and plant communities. From the shrub communities, maritime forests, ponds, and lagoons of the barrier islands, to the smooth cordgrass and blackrush marshes, and well-drained upland forests of oak, pine, holly, and magnolia, the plant communities and associated soil types provide a complex interaction between plants and soils.

Animals rearrange soil material by mixing and roughening the soil surface, moving plant nutrients to different horizons in the soil, and aerating and changing the porosity of the soil by burrowing and digging. The soil is mixed by the channeling of ants, wasps, worms, and spiders, and by the burrowing of turtles, other reptiles, and crustaceans such as crabs and crayfish. Within the uppermost few inches of the soil, bacteria, fungi and other microorganisms accelerate the decomposition of organic matter and increase the release of minerals that are important to plant growth. Humans can also affect the soil-forming process through vegetation removal or planting, repeated foot traffic that can compact soil layers, and through direct and indirect displacement, mixing and or covering from construction and development projects.

The topography or relief of Gulf Islands is nearly level with gently sloping areas with the greatest slopes occurring on active sand dunes or ancient sand dunes and sand hills. Relief has a significant effect on the soils. Sandy and loamy marine deposits have given rise to soils of similar texture. Because sandy soils do not retain excess water, most of the water available to plants in sandy soils comes from the water table. Because loamy soils have moderate to high water capacity, most of the water available to plants in loamy soils comes from the soils. Thus, the depth to the water table and the available water capacity affect the type of vegetation that grows in a particular soil. The depth to the water table also affects internal drainage. On the sand

ridges, where the water table is deep and soils are highly leached, soluble plant nutrients and organic matter are carried rapidly downward through the sandy soils. This downward movement occurs at a slower rate in loamy soils.

The length of time needed to form soil depends mainly on the combined influences of the other soil forming factors and the nature of the base geologic material. In geologic terms, relatively little time has elapsed since the base material for soil development was laid down or emerged from the ocean. The sands are almost pure quartz and are highly resistant to weathering. The finer textured silts and clays are the product of earlier weathering.

Soils on the barrier island ecosystems at Gulf Islands National Seashore are likely to incur some changes due to climate change. Barrier island sands and topography naturally shift with storms, tides, and sand accretion and erosion, and wetlands and beaches on mainland units are occasionally flooded during large storms. However, the combined effects of absolute sea level rise and the natural subsidence of soils along the Gulf Coast are expected to result in greater relative sea level rise. Mainland units including wetlands at Davis Bayou, recreational beaches at Johnson Beach and Okaloosa, and soils in campgrounds and visitor facilities also may be affected by rising sea level. Soils in low-lying mainland units and on barrier islands may be inundated more frequently and may erode at faster rates in the future due to climate change. Longer periods of drought or rain could alter soil moisture, affecting soil stability, nutrient content, and structure.

WATER QUALITY

Hydrology and water-related issues are of central importance because more than 80% of the national seashore is submerged land. Land use in the contributing watersheds strongly influences the biology, chemistry, and ecology of the national seashore. These land use patterns have contributed to problems such as pollutant loading in stormwater runoff, changes in groundwater recharge rates, oil and gas emissions from watercraft, atmospheric deposition of heavy metals, sewage effluent disposal, and loss of submerged aquatic vegetation due to degraded water quality. Sensitive aquatic systems around Gulf Islands National Seashore that may be affected by water quality include submerged aquatic vegetation and associated fauna, marshes, and nektonic communities (fish, reptiles, and marine mammals). Currently, Gulf Islands National Seashore is used for recreational activities such as camping, hiking, fishing, biking, swimming, boating, and bird-watching. Although the Mississippi islands are largely uninhabited, increased urbanization adjacent to the Florida section of the national seashore has impacted water quality.

The water quality of the Gulf is affected by river outflows, runoff from neighboring land, and cycling of the Loop Current. The eastern shelf of the Gulf of Mexico is influenced by the outflow of the Mississippi River. The Loop Current is a warm current that flows northward into the Gulf through the Yucatan Channel then turns eastward before exiting through the Florida Straits. This current affects hydrology by producing numerous eddies, meanders, and inclusions.

The Mississippi-Alabama shelf is characterized by fine sediments and suspended materials that originate in the Mississippi River outflow. The West Florida shelf has little sediment input and is primarily composed of high-carbonate sands offshore and quartz sands nearshore. The impact of the Mississippi River outflow is rarely observed in Florida, and therefore Florida waters possess greater water clarity.

One of the more likely changes to water quality due to climate change is related to ocean surface warming. Water temperatures are expected to rise about 1.8 degrees Fahrenheit in the next century (Loehman and Anderson 2009). Warmer sea surface temperatures generally increase pH (acidity), and also cause changes in water chemistry and quality. For example, warmer water may result in larger

areas of hypoxia, or low-oxygen conditions, with detrimental effects on vegetation and wildlife that are not adapted to those conditions (Ning et al. 2003). Because water temperature is intricately tied to numerous biochemical reactions in the water column, even slight alterations in water temperature may cause a variety of water quality parameters to change in ways that are difficult to predict. Additionally, there may be changes in water quality at the interface of fresh and salt water in some national seashore areas, where changes in precipitation patterns may affect runoff, oxygen and other nutrient content, and hydrology.

The following section describes existing water quality conditions that have a direct impact on these aquatic systems.

Florida District

The Florida District of Gulf Islands National Seashore is in the Pensacola Bay and Perdido Bay watersheds of Florida and Alabama. Major tributaries to Pensacola Bay and Perdido Bay are the Escambia, Blackwater, Yellow, and Perdido rivers. The Florida District extends north to the south boundary of the Intracoastal Waterway in the area north of Santa Rosa Island and Big Lagoon. Pensacola Bay, Big Lagoon, and the area north of Santa Rosa Island are connected to the Gulf of Mexico through Pensacola Pass, a 0.75-mile-wide natural opening with a maximum depth of 60 feet. The portion of the area north of Santa Rosa Island, adjacent to the national seashore, is approximately 2 miles wide, and waters within park jurisdiction in the sound average approximately 9 feet in depth. Big Lagoon is a 0.75-mile-wide lagoon connected to Perdido Bay, and waters under park jurisdiction average approximately 7.5 feet in depth. The national seashore southern boundary extends 1 mile out into the Gulf of Mexico, where jurisdictional waters average 15 feet in depth off of Perdido Key, 20 feet off of Fort Pickens, and more than 30 feet off of the Santa Rosa Area.

Because of its location in the northern Gulf of Mexico, the Gulf Islands National Seashore has tides that are primarily diurnal (i.e., usually only one high water and one low water per day). At the Pensacola Bay entrance, the maximum tidal range is 2.6 feet (NOAA 2002c) and the maximum current speed is 4.1 knots (NOAA 2003a). Annual water temperature in Pensacola Bay ranges from 56° to 86°F (NOAA 2002b). The salinity of waters around the national seashore varies seasonally and tidally. The average salinity in Big Lagoon and the area north of Santa Rosa Island ranges from 15 to 25 parts per thousand, while Gulf-side waters are saltier, averaging salinities of 30 to 35 parts per thousand (FDEP 2003d).

The Pensacola Bay system includes more than 140 square miles of surface waters in Escambia, East, Blackwater, and Pensacola bays. The area north of Santa Rosa Island consists of approximately 40 square miles of surface water and is one of the few water bodies within the Pensacola Bay watershed that contains moderately diverse seagrass beds. Fort Pickens Aquatic Preserve, established in 1970, encompasses approximately 34,000 acres of submerged lands surrounding the western end of Santa Rosa Island and the eastern end of Perdido Key and extends 3 miles offshore (FDEP 1999). The aquatic preserve's primary purpose is to preserve the biological resources in the area and maintain these resources in an essentially natural condition.

The Florida Department of Environmental Protection designated waters within Gulf Islands National Seashore as "Outstanding Florida Waters" (OFW) (FDEP 2002). This designation grants special protection to Florida waters based on their natural attributes. Florida Department of Environmental Protection cannot issue permits for direct or indirect pollutant discharges that would degrade ambient water quality of an outstanding Florida water. Permit requests for new dredging and filling in an outstanding Florida water must undergo an intensive review to determine if they are clearly in the public interest. Elements of the public interest include the conservation of fish and wildlife,

erosion and shoaling, navigation, fishing, recreation, and marine productivity. Exceptions to outstanding Florida water protection include permitted activities preceding outstanding Florida water designation, restoration of existing seawalls, and activities not regulated by the Florida Department of Environmental Protection for water quality protection purposes (i.e., fishing and boat speeds).

The waters surrounding the Florida District of the national seashore have been impacted by numerous nonpoint and point source pollution resulting in a reduction of natural biodiversity and productivity. Nonpoint sources include urban stormwater runoff, agricultural runoff, marinas, boat traffic, the drainage of wetlands, and seepage of contaminated groundwater into surface waters. Due to the proximity to the Gulf Intracoastal Waterway and the Pensacola Ship Channel, the national seashore has some of the heaviest boat traffic (industrial, military, and recreational) in northern Florida. Point sources include effluent from two sewer outlets near Pensacola, septic systems on Gulf Breeze peninsula, a chemical plant and coal-fired electric power plant on the Escambia River, a paper mill on the Perdido River, the American Creosote Works superfund site, the port of Pensacola, and Pensacola Naval Air Station, which contains a number of contaminated sites.

Gulf Islands National Seashore waters around the Perdido Key and Fort Pickens Areas are classified by Florida as being suitable for recreational purposes and for the maintenance of well balanced fish and wildlife populations, but do not have water quality suitable for shellfish harvesting. Most of the waters north of the Santa Rosa Island have suitable water quality for shellfish harvesting. None of the waters within the Florida District of the national seashore are under a fish consumption advisory, with the exception of a "no consumption" mercury advisory for large king mackerel throughout the Gulf of Mexico (FDOH 2003).

Mississippi District

The barrier islands of West and East Ship, Cat, Horn, and Petit Bois are 6 to 14 miles from the mainland and physically separate the Mississippi Sound from the Gulf of Mexico, except for a series of passes between the islands. As in the Florida District, the Mississippi Sound has tides that are primarily diurnal. The maximum tidal range at the Mississippi islands is 3.2 feet, and the average tidal range is 1.7 feet (NOAA 2002c). The waters surrounding these islands have a salinity in excess of 25 parts per thousand, except during the spring rainy season when waters in the Mississippi Sound range from 15 to 25 parts per thousand (NOAA 2003b).

Waters under park jurisdiction in the Mississippi Sound average 11 feet in depth, while Gulf-side jurisdictional waters are slightly deeper, averaging about 14 feet in depth. The Gulfport ship channel runs through Ship Island Pass, which separates Ship and Cat islands and is 5.5 miles wide with a maximum depth of 35 feet. Dog Key Pass lies between Horn and the Ship islands and has a maximum depth of 32 feet, but is less than 10 feet deep for most of its 5.5-mile width. Horn Island Pass, which contains a navigational channel to Pascagoula, runs between Horn and Petit Bois islands and has a maximum depth of over 40 feet, though it is less than 10 feet deep for most of its 3.5-mile width. Petit Bois Pass runs between Petit Bois and Dauphin islands, and has a maximum depth of 22 feet, but is 5 to 10 feet deep for most of its 5.5-mile width.

Because the islands in the Mississippi District of the Gulf Islands National Seashore are between 6 and 14 miles offshore and are undeveloped, the water quality has not been substantially impacted by human activities. The primary pollution sources include mainland urban stormwater and agricultural runoff, recreational boating, and commercial shipping in the Intracoastal Waterway and navigational channels in the passes. There are over 20 marinas along the Mississippi Sound in Jackson and Harrison counties.

National seashore waters in the Mississippi District are classified by Mississippi as being suitable for shellfish harvesting, with the exception of the areas including and surrounding the navigational channels running through the passes between the islands. The Mississippi Department of Environmental Quality monitors these waters and fish species for potential impacts on human health, and occasionally issues a fish consumption advisory, such as for mercury.

Water Quality Monitoring Programs

A number of water quality monitoring programs exist in the Pensacola Bay area. Most of these programs serve to ensure clean swimming and shellfishing waters and therefore the focus is on monitoring bacterial levels. Other programs monitor potentially harmful algal blooms and water quality in the tributaries of the Pensacola Bay Watershed. Florida coastal counties conduct beach water sampling every week, specifically for the purpose of monitoring waters for enterococci and fecal coliform bacteria. Gulf Islands National Seashore staff conducted a baseline water quality monitoring program in the area north of Santa Rosa Island and adjacent waters of Pensacola Bay in the late 1990s. In addition, the National Park Service monitors water quality at the national seashore as part of its servicewide Inventory and Monitoring program.

The Mississippi Department of Marine Resources, as the shellfish control agency, is responsible for the jurisdictional monitoring and classification of Mississippi's shellfish growing waters. The proliferation of toxic or nuisance species known as harmful algal blooms is rare in the Mississippi Sound, so monitoring is conducted only when observations indicate a bloom may be taking place. Mississippi coastal counties conduct beach water quality monitoring programs, but because the Mississippi islands are offshore they are not monitored.

The National Shellfish Sanitation Program (NSSP) requires all coastal states involved in interstate shellfish harvest and sale to classify their coastal waters to safeguard the public health from the consumption of contaminated shellfish.

Coastal waters are classified by the Florida Department of Agriculture and Consumer Services based on sanitary, hydrographic, meteorological, and bacteriological surveys. The Department of Agriculture and Consumer Services routinely monitors fecal coliform and water quality parameters at established stations in each of Florida's shellfish harvesting areas to provide maximum use of shellfish resources and to reduce the risk of shellfish-borne illness. Much of Pensacola Bay and Santa Rosa Sound are conditionally approved shellfish harvesting areas, with exceptions generally in areas surrounding marinas, harbors, and wastewater treatment plants.

The Mississippi Department of Marine Resources (MDMR) classifies coastal waters based on sanitary, hydrographic, meteorological, and bacteriological surveys. The Department of Marine Resources routinely monitors fecal coliform and water quality parameters in each of the state's shellfish harvesting areas to provide maximum use of shellfish resources and to reduce the risk of shellfish-borne illness. Most of the waters surrounding the Mississippi barrier islands in the Mississippi Sound and the Gulf of Mexico are approved noncommercial shellfish harvesting areas, with the exception of the navigational channels and surrounding areas between the islands.

The Florida Marine Research Institute (FMRI) monitors patterns and trends in the proliferation of toxic or nuisance species known as harmful algal blooms (HAB), as required by the National Shellfish Sanitation Program. Water samples are regularly taken at various distances offshore along the coast of Florida and analyzed for the presence of organisms that cause fish and shellfish poisoning. Any waters affected by harmful algal blooms are closed by the Department of Agriculture and Consumer Services.

Harmful algal blooms occasionally appear in the Gulf of Mexico, but are rare in Mississippi

Sound. The Mississippi Department of Marine Resources undertakes HAB monitoring, as required by the National Shellfish Sanitation Program, when conditions and observations indicate the possibility of a bloom event. When harmful algal blooms occur, the Mississippi Department of Marine Resources, in conjunction with the Gulf Coast Research Laboratory, closes any affected waters, conducts sampling, and provides daily monitoring reports. In fall 1996, concentrations of the red tide organism were sufficient to cause a public health risk, and, consistent with the NSSP regulations, all Mississippi oyster growing waters were closed.

Under Florida's Healthy Beaches Program, county health departments conduct beach water sampling every week specifically for the purpose of monitoring waters for bacteria (enterococci and fecal coliform bacteria). High concentrations of these bacteria may indicate the presence of microorganisms that could cause disease, infections, or rashes to bathers. County health departments issue health advisories or warnings when high bacteria concentrations are confirmed. The Santa Rosa County Health Department conducts sampling at seven beach sites near national seashore waters, and the Escambia County Health Department conducts sampling at eight beach sites. The Florida Department of Environmental Protection monitors water quality on a weekly basis at an additional four sites in and around national seashore waters. Other water quality parameters monitored include temperature, salinity, dissolved oxygen, chlorophyll, water color, turbidity, and nutrients.

The Florida Department of Environmental Protection and the Bream Fisherman Association cooperatively conducted a water quality monitoring program focused on the rivers of the Pensacola watershed from 2000 to 2002. Sampling trips targeted specific basins within the Blackwater, Yellow, Perdido, and Escambia rivers, with only one station near park waters (Big Lagoon). Twelve trips were undertaken per year, throughout the year, sampling 46 individual stations. The water quality parameters investigated were: fecal and total coliform bacteria, conductivity, color, turbidity, nutrients, and biological oxygen demand. The project has documented baseline water quality information in some waterbodies, and has continued long-term ambient trend monitoring in others.

Gulf Islands National Seashore conducted a surface water quality monitoring program during 1996 and 1997 in the area north of Santa Rosa Island and the adjacent waters of Pensacola Bay to provide a baseline database for subsequent environmental assessments in the sound. Recent residential and commercial development in the vicinity of Santa Rosa Island has increased the possibility of nutrient and bacterial contamination in the sound. Among the potential sources of nutrient and bacterial contamination are septic systems, wastewater treatment facilities, fertilizer runoff, and recreational activities at beaches and campgrounds. Temperature, salinity, dissolved oxygen, pH, and turbidity were measured at 52 sites within and adjacent to the national seashore in the area north of Santa Rosa Island. Although the investigation indicated spatial and temporal variability in surface water chemistry, there was no indication of chronic water quality problems in the area (ICER 1998). Hydrocarbon pollutants from boat activity have not been monitored in the national seashore. Future planned inventories would provide information on water quality that will serve as a baseline for future monitoring activities.

WETLANDS

Much of the vegetation between the ocean and the uplands at Gulf Islands National Seashore is considered tidal marsh, discussed below and analyzed within the Terrestrial Vegetation and Wildlife component of this general management plan. However, hydric soils and emergent wetland vegetation became more prominent following the hurricanes in the past decade.

Per NPS Director's Order 77-1, the wetlands procedural manual, the National Park Service adheres to the Cowardin et al. 1979 wetlands

classification scheme. Cowardin et al. 1979 lists the area along beaches, or similar shorelines, from the mean low low and the mean high high tides as wetlands. These areas, of which there are many miles at Gulf Islands National Seashore, are subject to all NPS wetlands policies and procedures for planning and management.

In the Florida District, wetlands became established in the Okaloosa Area after Hurricane Opal in 1995. Other wetlands have become established near Fort Pickens and along the Fort Pickens road following the 2004 and 2005 storms.

In the Mississippi District, wetlands are now found in areas of Davis Bayou that are dammed or blocked by roadways and culverts, resulting in the unnatural ponding and retention of water. Natural wetland vegetation, created in large part after the hurricanes, is also present on Cat Island, West Ship Island, and Horn Island.

The National Park Service adheres to a "no net loss" of wetlands policy, as well as other federal and agency policies. As wetlands shift in area over time, delineation of wetlands in a specific project area will be required at the time of implementation. Gulf Islands National Seashore staff will prepare a "Statement of Findings" should the implementation of any component of this general management plan result in adverse impacts on wetlands. Therefore, wetlands are discussed briefly in this general management plan, and tidal marshes are discussed extensively below. Further environmental compliance and permitting is expected during project implementation per National Park Service and U.S. Army Corps of Engineers requirements.

TERRESTRIAL VEGETATION AND WILDLIFE

Note: The scientific names for the plants in the following discussions can be found in appendix B.

Emergent and Terrestrial Vegetation

Tidal Salt Marshes. The salt marsh community is composed of wet and salt tolerant grasses and sedges growing along the fringe of intertidal flats within the sound and bay shores that are exposed to the ebb and flow of the daily fluctuating ocean tides. This community occurs in relatively protected niches and drainage basins and creates a transition from the open water to the emerging land. Because this vegetation community must tolerate daily flooding and saline conditions, relatively few species grow in this environment, and the subtypes or zones within this community are often composed of nearly pure stands of a single species. Stands of these grasses and sedges provide the unique, repetitive and rhythmic texture so characteristic of the tidewater regions of the southeastern United States that is immediately identifiable by nearly all who have visited this type of environment.

Despite areas of single species, such as *Juncus* or marsh grasswes, the tidal marsh is one of the most productive environments in terms of the annual biomass growth of vegetation anywhere in the continental United States. This characteristic is a direct result of the interface between the open water and the land where both sources provide regular water, sediment, and nutrients. The high growth rates of this vegetation community and the constant recycling of plant material coupled with the ability of the grasses and sedges to trap fine sediment creates mucky, silty loam soils that are rich with accumulated dead organic material. This constant decay of plant material also creates a decidedly detritus environment where many species that occur in the salt marsh are well adapted to subsist on. Food chains within the marsh ecosystem are relatively simple and when coupled with

the high level of plant growth, the annual yield in terms of fish and shellfish is also very high. This community is critical for providing feeding and nursery grounds for many Gulf Coast species. Some phase of the life history of most Gulf Coast marine species is spent in marshes and estuaries. Marshes also provide vital habitat for migratory waterfowl during winter months.

The tidal salt marsh is divided into three general zones that loosely correspond with associations of different species and elevation within the intertidal zone. These zones include the low marsh, mid-elevation marsh, and the high marsh. The low marsh is inundated daily, often has higher saline concentrations than the other zones due to its proximity to the open water, and is characterized by the usual dominance by smooth cordgrass. The mid-elevation marsh is usually less saline than the low marsh and is dominated by black needlerush followed by salt grass, and sometimes with saltwort, chestnut sedge, and Gulf Coast swallow-wort. The high marsh is only inundated during the highest tides, such as with spring and storm tides and is dominated by marsh hay, followed by black needlerush and sometimes with water smartweed, saltmarsh morning-glory, and buttonweed. Where salinity is moderate to high, salt grass, leafy bulrush, glasswort, and salt marsh aster may be present. In any of these marshes where salinity is lower, big cordgrass and lance-leaved arrowhead may occur. In the mid-elevation salt marshes with higher salinity, three-square bulrush and salt marsh bulrush may also occur. In the sparsely vegetated sand flats known as salt panes and in the highly saline high marshes, glasswort, sea lavender, sea ox-eye, groundsel, and marsh elder are common.

Although these zones generally follow the trends described above, at Gulf Islands the pure stands often occupy less area than the mixed marshes that are composed of several species. These zones often smoothly transition from one to the next and the high marsh will often transition into the dune grassland and mesic meadow communities with little or no easily recognizable distinction. This community type occurs in all locations within Gulf Islands and was heavily impacted during the 2004 and 2005 hurricane seasons.

Brackish Ponds/Lagoons/Freshwater Marshes (Includes Constructed Ditches and Borrow Pits). This community is located in permanently flooded to intermittently exposed wetland depressions. This community type is generally found in freshwater environments. In some cases, where lagoons are connected to the sound or ocean, where frequent overwash occurs, where residual concentrations of salts exist in the base soils, or where salt water intrudes into the groundwater, water may be brackish with varying levels of saline concentrations depending on the specific circumstance and location. This community's habitat is usually formed during severe storm overwash events such as during hurricanes when the storm surge rushing across the islands scours and gouges out depressions. These depressions subsequently fill with fresh or brackish water in elliptic and irregular linear depressions creating ponds and lagoons. In the case of constructed ditches or borrow pits, the excavation of sand in the past to create drainage dikes or for use as fill in other locations creates an environment of similar morphological character to that of the naturally formed depressions and is colonized by the same plant community type.

The relatively high water table and associated lateral seepage through the coarse sandy soils is the primary source for the water that fills and maintains these wet depressions. Frequent rains also play an important role in recharging water levels in these depressions and providing an additional fresh water source. Soils are predominantly sandy, often times with muddy and organic deposits on the bottoms. Water depths tend to be relatively shallow, averaging 1 to 3 feet deep, although depths as much as 9 feet have been observed in some ponds.

Vegetation in these ponds and lagoons can vary considerably from densely vegetated to sparse, depending on history of formation and

frequency of disturbance. Salinity levels can also be a determining factor in species variances. In the open, deeper portions of the ponds, submerged or floating aquatic vegetation may include duckmeat, duckweed, Carolina mosquito fern, and frog's bit. Various species of algae occur, and at least two species of stemmed algae, muskgrass and brittlewort, are frequent. Widgeongrass, a species of seagrass, occurs in both brackish and freshwater lagoons and ponds. Where widgeongrass is found in freshwater ponds, it is likely that these ponds evolved from lagoons that were closed off from the sea. American eelgrass is a species found in many of the freshwater ponds and indicates origination by germinating seeds because this species is highly intolerant to saline conditions.

Most emergent species are restricted to the shallow margins at the edges of these ponds.

The most common species include many of the rushes and sedges described in the dune grassland community along with marsh pennywort, cattail, sawgrass, marsh fleabane, royal fern, swamp rose mallow, Carolina redroot, and occasionally yellow pond lily. Woody species may include buttonbush, marsh elder, gallberry, swamp titi, sweetbay magnolia, wax myrtle, and groundsel.

Because of the dynamic nature of barrier islands, these water features tend to constantly change and in many cases are short lived. The very processes that create these ponds—severe storms and the opening and closing of lagoons by long shore currents and wave action—are probably the reason that keeps these features in existence. Scouring storm surges and the constantly changing salinity of lagoons are often the responsible factor for preventing vegetation from succeeding in these sites, thereby preventing the depressions from filling in with vegetation over time.

Next to the saltwater marsh community, this community is one of the most productive communities at Gulf Islands. This community type is sensitive to a variety of disturbances and hydrologic influences. Because of the rapid lateral seepage of groundwater through the surrounding sandy soils, sewage disposal leach fields adjacent to these communities can overload the natural nutrient load and balance within these waters creating substantial adverse effects on this environment. Withdrawal of groundwater through the use of wells also can increase the infiltration of salt water into the limited freshwater lens below the surface, also changing the natural cycle and balance of salinity in these fresh and brackish water systems.

This community type occurs on all islands and in limited cases, especially regarding constructed ditches and borrow pits, on the mainland sites as well.

Bayhead Swamp. Bayhead swamps are forested wetlands found at or near the heads of smaller tributaries of large drainage basins or as the main part of smaller or local drainage systems. These wetlands drain quickly following rains. Commonly occurring trees include sweet bay magnolia, swamp black gum, red bay, red maple, slash pine, and sweetgum. Common shrubs include wax myrtle, large gallberry, and swamp titi. The ground or herb layer commonly consists of cinnamon fern, royal fern, netted chain fern, lizard's tail, sphagnum moss, with occasional grasses and sedges. Laurel-leaf greenbrier is also common. Bayhead swamps occur throughout the coastal plain region of the southeast, representing integral components of the drainage systems of any upland and many wetland habitat types. This habitat type occupies the upper portions of linear basins that help to drain surface water from the landscape. This habitat typically drains almost completely after rain events. Fire is not an apparent controlling factor in this habitat type, occurring only in dry conditions. Soils are hydric, composed of varying combinations of sand, silt and clay.

This community occurs on mucky silt loams within Davis Bayou.

Intertidal Beach/Foreshore. The intertidal beach is the semiterrestrial zone located

between high and low tides and is often referred to as the foreshore. This zone is highly dynamic where wave action creates a turbulent environment constantly moving large volumes of sand. This zone also experiences the extremes of intermittent exposure to air and water where daily tidal inundation submerges this zone during high tide and exposes a wet, hard-packed, sandy environment during low tide. As a result, rooted plants are unable to take hold, confining this environment to that of a detritus ecosystem where primary productivity is limited to unicellular algae. The relationship between plants and animals in this community is very close. Euglena is a common species of algae that give the characteristic green hue to the sandy beaches, especially during overcast days. During bright sunny days, the algae will retreat into the moist interspaces between sand grains. The algae and other small amphipods and polychaete worms that reside in the spaces between the sand grains are referred to as psammon and are an important food source for sandpipers and other animals that will hunt this zone for food as the waves roll back and expose the open sand.

Upper Beach and Berm/Backshore. Between the intertidal beach and the primary dune is the upper beach or backshore. The beach berm usually delineates the intertidal beach from the upper beach although this is not always the case. The berm is essentially a miniature scarp line that defines the edge of the upper beach from the highly turbulent surf zone within the intertidal beach. The upper beach is controlled in large part by the frequency of storms and is only slightly more stable than the intertidal beach. Under normal conditions, the berm runs parallel to the water line and is created by the onshore deposition of sand particles at the upper limits of the wave reach within the intertidal beach. The main berm is located at the upper reaches of the high tide waves, but often there exists a minor berm at the upper reaches of the low tide when the intertidal beach is exposed. During severe storms, a berm may extend into the upper beach zone. For purposes of defining the upper beach, this delineated border relates to the main berm, which under normal conditions is defined by a slight crest behind which is generally dry, loosely deposited sand.

Vegetation is extremely sparse, widely scattered and dependent on the relative stable periods of time between severe storms. Some of the more common plants that grow in this environment include sea rocket, sea purslane, seaside spurge, sea-beach atriplex, beach tea, fiddle-leaf morning glory, and railroad vine. These seeds most often germinate in drift lines where debris and driftwood accumulate after being washed up during winter storms. The perennial sea oats will also germinate in the drift lines and will begin to form embryonic dunes. If the drift line is far enough back on the upper beach, safe from frequent storms, primary dunes will begin to form. Otherwise, these small dunes or dunelets will be washed away or covered during regular storms before they are able to establish the primary dune community.

Foredune/Primary Dune/Dune Strand. This dune community also grows in one of the most dynamic and harsh environments of all the community types at the national seashore. Primary dunes are formed by fine grains of windblown sand and occur immediately adjacent to the beach and berm on the gulf side of barrier islands. The upper beach provides an ample supply of sand for dunes to grow and develop. The vegetation that grows in this environment plays a critical role in the formation, growth, shape and eventually stabilization if conditions allow within the dune environment. The instability, poor soil nutrients, and almost nonexistent soil moisture make plant establishment very difficult in this environment. Primary dunes are dynamic because of the constant movement of sand causing dunes to build, blowout, and migrate. Primary dunes also bear the brunt of storms that often remove great volumes of sand from the dunes.

The plants that grow in the dune environment have special adaptations to withstand high winds; salt spray; intense solar radiation; and shifting, elevated sands that percolate quickly—making for an extremely xeric environment. Most dune plants have

rhizomatous root systems that form an extensive mat of fine roots within the loose sand that is highly adapted to capture moisture as it quickly percolates through the sand and that binds and stabilizes sand particles. Dunes begin to form on the upper beach berm where seedlings of sea oats, marsh hay, and sea rocket take hold in drift lines where debris and driftwood accumulate or in other similar locations. Sea oats are the most important plant in the dune building sequence as this species is the most resilient of all the dune plants to the harsh environmental conditions.

Sea oats also require burial and stratification to germinate. The drift that contains seeds acts as the first barrier to sand movement, and small dunelets form as sand is blown off the beach, berm, and overwash terraces. In the first year after burial, seeds germinate and the seedlings begin trapping more sand. By the second year, the dunes become larger as the new sea oat shoots trap more sand and continue to grow upward through the freshly trapped sand. Within four or five years, dunes can grow to a meter or more in height, particularly where sand sources are readily available, such as well out on the berm crest or where the beach is at right angles to prevailing winds as is the case with most beaches at Gulf Islands. As dunes grow, sea oats will show a vigorous response as long as sand continues to blow in on the grass.

Vegetation cover also varies in density based on location. Under such conditions, the first dunes can become stabilized by the pioneer species listed above and on the leeward side of the dunes are soon joined by beach grass, little bluestem, Le Conte's flatsedge, fiddle-leaf morning-glory, rough buttonweed, seaside sandmat, seaside pennywort, seashore elder, Virginia creeper, horseweed, camphorweed, wild bean, and pepper-vine. On the windward side of the dunes, typically facing the Gulf, plant cover tends to be more sparsely vegetated. On the more protected leeward side of the dunes, vegetation cover often occurs at a greater density than on the windward side.

Natural dune strand communities can develop on the berm, on overwash terraces, or on old inlet shoals wherever sand can be blown. The primary stresses in this habitat are moving sand and salt spray. Drought, lack of nutrients, and temperature fluctuations create additional stresses. Moving sand and salt spray are also necessary nutrient sources, and when they are cut off by other dunes or by stabilization, the dune community declines. Because the natural growth trend is toward stabilization and because the primary dunes protect the rest of the island from storm surges and salt spray, the establishment of this community often provides stable ground for plants from the shrub and thicket and woodland communities to invade the dune sites. When dunes are destroyed by natural processes such as storms, this long process will repeat, provided that there is stable ground for the accretion process to begin again.

Primary dunes are found on all islands within Gulf Islands National Seashore. The dunes and dune communities were largely obliterated following the hurricane seasons of 2004 and 2005 and have slowly been rebuilding since that time. Despite the incredible resilience to the harsh natural environmental conditions, the dune communities are highly susceptible to impacts from foot traffic and are therefore one of the most sensitive plant community types at Gulf Islands.

Secondary Dune Field/Back Dune. Behind the primary dunes and along the sound side of the barrier islands, the landscape is comprised of more stabilized dunes interspersed with grassland and swale plant communities. These dunes are generally more protected than the primary dunes on the Gulf side and as a result achieve the greatest density of vegetation cover of all the dune communities as well as a mingling of species from other adjacent community types. The greatest similarity of plant types is with the primary dune community, although some species such as yellow buttons occur in the relict dune community. In some areas this plant community slopes gently out of low rolling dunes, into the sound. In other areas there is a sharp break between the vegetated portion of

this community, and the nonvegetated portion of the sound-side beach. Soils are coarse to fine sand. If stable conditions permit, typically on the largest dunes, this community type may in time transition into the relict dune community type.

Relict Dunes. Relict dunes are the remains of ancient dunes, once active, that have been stabilized for a considerable period of time. These dunes indicate a former geomorphic process that was different from the current process based primarily on island migration, other dunes and dune formation, changing sea levels, changing climate, and changing vegetation communities. Relict dunes can revert to an active state as a result of major environmental changes following tropical storms or hurricanes. These dune areas are located most frequently in the central and sound side of the barrier islands. The dunes occur most commonly in east-west strips paralleling the long axis of the islands or as diagonal sandy ridges across the islands. Some may run north to south. Many of the highest points on the islands are located within the relict dune fields. Soils are sandy and the vegetation cover is often incomplete. During the two hurricane seasons in 2004 and 2005, many of the relict dune areas were heavily impacted, greatly reducing the size of these features and eliminating much of the vegetation communities occurring there. The most abundant species is goldenrod. Other species with high frequency are coastal sand frostweed, rosemary, and panicum. Other species largely confined to relict dune areas are yellow buttons, narrow-leaved pinweed, eastern prickly pear, and two lichens—cup lichen and prostrate cup lichen. The combination of goldenrod, rosemary, coastal sand frostweed, narrow-leaved pinweed, and the two cup lichens is diagnostic for this habitat type.

Relict dunes occur on Santa Rosa Island, Perdido Key, Petit Bois, and Horn and Cat islands.

Barrier Flat Grassland/Overwash Terrace. This vegetation community is found on the broad, flat terraces in the low elevation areas on barrier islands where storms create overwash zones. This community is frequently disturbed by periodic oceanic overwash that acts as the limiting factor often keeping this community assemblage from ever succeeding into another community type. The development and maintenance of this community type is controlled both by salt spray and by oceanic overwash. Because the land is low enough to be flooded and buried with fresh deposits of sand during major storms, plants are growing under some of the harshest conditions within the barrier island communities. The species that dominate this community type are well adapted to sea-water flooding. The overwash community begins on the back side of the beach berm and stretches across the flats to the sound side. The vegetation is well adapted to overwash burial and the rolling-over process by which barrier islands retreat and migrate. As long as overwash events occur, this ecosystem will persist for long periods of time and can therefore be considered an "overwash subclimax community." This vegetation community consists primarily of grasses, sedges, and a few forbs.

Toward the berm, the vegetation is the sparsest where flooding and burial are most frequent and usually dominated by marsh hay and scattered annuals such as seaside spurge and sea rocket. Closer to the berm edge, the vegetation community is kept at bay by frequent salt spray and overwash events.

Back from the berm zone in more protected areas where overwash and salt spray are less severe, the vegetation increases in complexity and biomass. Spartina is denser and is joined by seaside goldenrod as a codominant species. In the most protected sites within this community type, other common species to join the dominant species include love-grass, chestnut sedge, Gulf muhly grass, dune sandbur, fingergrass, blanketflower, marsh fleabane, marsh pink, Gulf Coast swallow-wort, salt marsh morning glory, and nodding ladies tresses. Species from the other grassland communities and the high marsh community will mix in this community type. If the frequency of overwash and flooding decreases and the environment becomes more

sheltered from dunes building within this overwash zone, shrubs such as marsh elder, wax myrtle, and groundsel will begin to form a shrub savanna or thicket.

This community type can be found on several overwash areas on most of the barrier islands at Gulf Islands National Seashore during periods of no major storms. Several of the overwash areas following the hurricane seasons of 2004 and 2005 have shown the early stages of reestablishment of this community type in recent years.

Dune Grassland/Coastal Grassland/Dune Slack. This community type is found in the interdune areas where the ground is gently rolling or flat within the lower elevations. A high water table provides more available moisture than beach or dune areas and frequently contains relatively lush grassland vegetation that is often marsh-like depending on the groundwater level. This type of habitat is treeless with occasional shrubs and quite diverse with species from nearly all the grassland types, including marshes, and contains areas somewhat wet during part of the year to areas very well drained and dry. This community type is distinct from fresh water marshes and high marshes in that it tends not to have standing water during most of the year. Soils vary from peaty to sandy, with organic matter almost always greater than that of the beach or dune areas. Cover is often nearly complete in the lower, peaty areas to sparse in the higher, sandier areas. Aeolian removal ceases when sand is wet, so the bottoms of these dune slacks are usually level. Similar areas occur where migrating sand dunes have partially filled fresh-water marshes. These depressions are fairly well protected from salt spray and, if well within the dune zone can also be protected from overwash.

Dominant species include southern umbrella-sedge, broomsedge, marsh hay, chestnut sedge, three square bulrush, white top sedge, knotroot bristlegrass, large headed rush, black needlerush, needlepod rush, maritime bluestem, and muhly grass. Other common species include goldenrod, rough buttonweed, creeping centella, seaside pennywort, smooth water hyssop, dayflower, marsh pink, frog's bit, sundrops, evening primrose, sea purslane, and perennial glasswort. Common vines include coastal morning glory, climbing hempweed, and Gulf Coast swallow-wort. Occasional woody shrubs include groundsel and wax myrtle. This community type is often the first to colonize open expanses of scoured land or freshly deposited sand flats. If conditions allow, with little to no disturbance, this community type may eventually succeed into shrub and thicket as woody shrubs begin to colonize the stabilized land.

This community type occurs on Santa Rosa Island, Perdido Key, Petit Bois Island, Horn Island, East and West Ship islands and Cat Island. The exotic, invasive plant, torpedo grass (native to Australia) occurs in this community type and has been difficult to control.

Mesic Meadow or Coastal Interdunal Swale. This community type is similar in environment and vegetation to the coastal grassland or dune slack and is often expansive with low flats and swales that are very close to or that intersect the water table. Such flats and swales are usually very old overwash terraces or old tidal deltas no longer in the intertidal zone. The resulting dune and swale topography is protected by seaward dunes that have not been recently overwashed. The hydrology is dictated by the high water table and heavily influenced by relatively frequent rains that often flood large sections of the lowest areas.

Except for forested woodlands, these low, moist flats contain the greatest number of plant species of the Gulf Islands community types. The vegetation on these protected flats is complex and contains species from all the other grassland communities other than characteristic dune plants or intertidal marsh species. This community is rich in grasses, sedges, and herbaceous plants. In general, the vegetation community is much like that of the dune slack or coastal grassland community type except that the vegetation is much more extensive and contains more species.

The occurrence of standing water for relatively long periods of time and the overall greater species diversity are the primary distinguishing characteristics between this community and the dune slack or coastal grassland community. In addition to the species listed in the dune slack or coastal grassland community, other dominant species include goldenrod, southern beeblossom, wild lettuce, loosestrife, St. John's wort, redroot, and yellow-eyed grass. Paspalum and panic grasses are common as well as species from the sedge family. With time and lack of major storms, woody shrubs including groundsel and wax myrtle will begin invading these sites. This community type is sensitive to trampling from repeated or excessive foot traffic. Periodic fire is a natural event within this community type, although the relatively wet hydrology is the primary factor for maintaining the species assemblages.

This community type exists on all islands within the national seashore.

Shrub and Thicket. Where environmental conditions protect the land from the most extreme salt spray, sea water flooding and moving sand—such as within stabilized sand dunes, dune swales, protected overwash terraces and sand flats, and on the fringes of the high marsh on barrier islands—woody vegetation is able to grow and become established. Although this community does not tolerate the most extreme salt spray, these woody plants are considered salt tolerant and are periodically subjected to heavy salt spray giving the characteristic wind sculpted appearance behind dunes. The shrub community represents the early seral stage of developing maritime woodland. Although this community type represents an earlier stage of development, the shrub and thicket habitat may persist for a long time under the right circumstances. Because this community is a pioneer woody community, establishment patterns can be relatively dynamic based on storms.

During periods of relatively little storm flooding, scattered wax myrtle, groundsel, and marsh elder will grow and become established in the protected areas described above. With the passage of time, the seaside dunes continue to build up and the secondary dunes become more stabilized. In this woody habitat further soil development occurs, and these three main pioneer woody species are joined by eastern red cedar, Hercules'-club, yaupon, loblolly pine, red bay, buckthorn, and eventually shrubby live oak. Woody vines such as poison ivy, catbriar, Virginia creeper and grape are also common. The shrub and thicket community tends to be located on poorly to excessively drained sands that may have a high water table. In time, the shrub community grows into an all but impenetrable thicket, tangled with tight branches and vines, especially on the higher ground such as within stabilized dunes and well protected flats. In the lower areas, a more open shrubland savanna is common. Eventually, this community type will succeed into the maritime forest community if conditions allow.

This community type exists on all islands within the national seashore.

Maritime Forest. The maritime forest of the lower gulf coastal plain region is part of a series of vegetative assemblages that occupy the barrier islands and mainland shoreline areas exposed to the effects of the salty environment of the open ocean. As such, this habitat is defined by location and by the presence of salt tolerant vegetation. On barrier islands, a progression of assemblages is recognized between the highly unstable foredunes that form on the seaward side of islands, and across the more stable dune, shrub and forest habitats.

On mainland shoreline sites, some or all of these assemblages may be less well developed and/or absent. The older, most protected and most stable dunes support a scrub-tree forest composed of live oak, buckthorn, red bay, slash pine, loblolly pine, palmetto, saw palmetto, wax myrtle, and others. Older forests may support shrubs such as large gallberry, huckleberry, and fetterbush. The climax maritime forest assemblage includes live oak, laurel oak, and sweetbay magnolia.

Within the range of maritime communities, fire is most often associated with scrub habitats, occurring with 30- to 35-year frequency. Although fire is also reported in pine-dominated stands and live oak forests, it does not appear to be a major factor affecting vegetation in the maritime forest community. Factors such as coastal storms, topography, and proximity to salt spray appear to be more important in affecting community structure. The entire grouping of maritime communities is typically found within the first few hundred meters of open marine areas. These communities exist within the relatively narrow band of well-drained sandy dune fields of island and mainland areas. Except for the periodic flooding associated with tropical storms, these soils are typically well drained, composed of coarse to fine sand with little organic material and are nutrient poor. Some mainland sites may exist on hydric soils.

This community type occurs in Naval Live Oaks, Davis Bayou, Cat Island, and Horn Island.

Southern Mixed Hardwood. The southern mixed hardwood forest community of the lower gulf coastal plain region (formerly the longleaf pine forest) is a pine-dominated upland habitat commonly occupying sites on high sandy ridges that includes a variety of hardwood species and a varied assemblage of understory trees and shrubs. In addition to longleaf pine and loblolly pine, the canopy layer of the mixed hardwood forest may include beech, laurel oak, southern magnolia, white oak, sweetgum, water oak, southern red oak, pignut hickory, black gum, and post oak. Sweetgum, water oak and black gum are commonly understory trees, particularly as saplings, along with flowering dogwood, tree huckleberry, American holly, red maple, and black cherry. Common shrubs include yaupon, squaw huckleberry, and horse sugar. Poison ivy, catbriar, and grape are also common.

Historically, naturally ignited, periodic fires (3- to 5-year cycle) maintained a forest dominated by the fire-adapted longleaf pine with an open grassland understory—thus the designation as the former longleaf forest. Loblolly pine and many of the above-listed hardwood trees and shrubs were restricted by fire to isolated protected areas of the forest and to the wetter sites, and they have only recently invaded the forest in absence of periodic fire. Early successional stages that develop following the harvest of canopy species consist of grasses, forbs, and seedlings of pines. This habitat type occurs on well-drained rolling hill topography of the lower coastal plain. Soils are well-drained, upland soils of various types.

This community occurs primarily in Davis Bayou, occurring on well-drained, fine sandy loams. As long as periodic fire is prevented from occurring, this community type will continue to maintain the general forest conditions observed today, including a relatively closed canopy of mixed pine and hardwood species, a relatively diverse assemblage of shrubs and saplings, a relatively bare herbaceous layer, and a mixed composition of vines. Although definite ages have not been established, the largest trees appear to be in the range of 40 to 60 years old. It is probable that this community type was once longleaf pine forest and the pines were harvested within the past 100 years. The current lack of longleaf pine within these sites is a result of fire suppression. Longleaf pine would be a dominant component of the canopy under natural conditions associated with periodic fire. Although some longleaf pines are still present, they are at a low density relative to loblolly pine. The absence of longleaf pine is likely the result of harvesting original trees, the establishment of faster-growing pines and hardwoods, and the current practice of suppressing fire. Fire suppression prohibits the natural regeneration of longleaf pine.

Transitional Wet Forest. Transitional wet forests occupy a zone of transition from one habitat type to another. In the case of Davis Bayou, this community occupies the wet soil slopes between upland ridges within the national seashore. This habitat designation was recognized to account for the wet soil areas delineated up slope of the adjacent tidal marshes that were clearly not affected by the

normal tidal action. Groundwater seeping from the upland ridges is the apparent source of water responsible for the wet soil conditions. Although similar to bayhead swamps in general characteristics, this habitat type can also include vegetation found in the adjacent mixed hardwood forest. The affect of fire in this habitat is unknown. Although similar to bayhead swamps in vegetative and soil characteristics, the upland proximity to fire-susceptible southern mixed hardwood forest may expose them to periodic fire. As with bayhead swamps, these habitats may support fire only under dry conditions.

Wet Pine Savanna/Longleaf Pine Savanna. Wet pine savannas are open grasslands with scattered pines that occur on poorly drained, flat terraces of the lower coastal plain region of the southeast. This habitat belongs to a broad group of pine-dominated forests referred to as "flatwoods" that include pine flatwoods, southern mixed hardwood forest, and longleaf pine-turkey oak forest. As with all flatwood habitat types, longleaf pine is the dominant tree, and a periodic fire (3-5 year cycle) helps to maintain this and numerous other fire-adapted species. Trees are typically widely spaced or absent in the wettest sites. In absence of fire, slash pine may become more dominant and, along with shrubs, create a dense canopy that limits understory vegetation. Although large individual slash pines can survive "cool" ground fires, this species does not have a fire resistant "grass" stage like the longleaf pine. Under natural conditions of periodic fire, longleaf pine is the only common tree species that thrives. In the absence or suppression of fire, slash pine, red maple, sweet bay magnolia, and red bay may become more common, as well as shrubs like common gallberry, large gallberry, yaupon, wax myrtle, and swamp titi.

Under natural conditions of periodic fire, a diverse assemblage of herbaceous plants forms the ground layer grassland, including species that are adapted to fire and nutrient-poor soils characteristic of this habitat. Common grasses include wiregrass, muhly grass, bluestar, and toothache grass, along with fire-adapted shrubs such as dwarf huckleberry and running oak. This habitat also includes a large number of carnivorous plants, including pitcher plants, sundews, butterworts, and bladderworts, as well as numerous species of terrestrial orchids, sunflowers, and other flowering plants. Laurel-leaf greenbrier is a commonly occurring vine in this habitat, even with the absence of trees.

Wet pine savanna/longleaf pine savanna occupies wet (hydric) areas that may grade into more mesic pine flatwoods. This habitat occupies the flat terraces of this part of the coastal plain that were historically covered by shallow seas. Within the thick beds of sands deposited in this region, accumulated organic matter, aluminum, and iron form relatively impervious barriers. These barriers prevent water from percolating through the soil and lead to the development of perched water tables and saturated soils, particularly during the wet seasons of the year (winter/early spring). These hydric soils range from being uniformly clayey in the wettest of hydric sites to mottled in appearance on dryer, mesic sites. Mottling is due to the seasonal nature of soil saturation that leads to the reduction of iron within the soil and subsequent oxidation of that iron within the pore spaces of the soil.

Wet pine savannas occur on the wettest or more hydric soils with standing water remaining for weeks to months. Wet pine savannas typically occur on poorly drained silty loams that are often adjacent to wet pine flatwood sites. The historical absence of fire leads to alterations in the floral nature of these sites and can mask the natural community composition of these habitats. Unless periodic fire is reintroduced to these sites, they will continue to develop toward the conditions for wet pine flatwoods. Some, if not all, of the adjacent wet pine flatwood areas were probably once and can again become wet pine savanna habitat under an active program of prescribed burning. Continued absence of fire has resulted and will continue to result in the alteration of biodiversity in these habitats.

Pine Woods/Wet Pine Flatwoods. The term pine flatwoods refers to pine-dominated

forests that occur on moderately to poorly-drained flat terraces of the lower coastal plain region of the southeastern United States. Pine flatwoods tend to be found on somewhat dryer, mottled soils that may have standing water for days to weeks. The wet pine flatwoods considered here are part of a broad grouping of pine dominated forests that includes the southern mixed hardwood forest and the longleaf pine-turkey oak sandhill habitat. Pine flatwoods occur on moderately to poorly drained soils. As with the upland forests, longleaf pine dominates moderately to poorly drained sites, where periodic fire (3- to 5-year cycles) helps to maintain this fire-adapted species. On wetter or downslope areas of these forests, slash pine may become more dominant, particularly where it may be protected from fire. Although large individual slash pines can survive "cool" ground fires, this species does not have a fire-resistant "grass" stage like the longleaf pine. The less tree-dominated wet pine savanna also falls into this broad group of "flatwoods."

In addition to longleaf pine and slash pine, the canopy of flatwoods may include black gum, red maple, sweetgum, southern red oak, water oak, laurel oak, and sweetbay magnolia, with the hardwood species becoming more common in sites where fire has been suppressed. Common shrubs include saw palmetto, common gallberry, large gallberry, swamp titi, fetterbush, wax myrtle, red bay, and winged sumac, along with vines such as catbriars and grapes. A rich assemblage of grasses and other herbaceous plants is also common, particularly where fire maintains an open, grassland understory, with common species including wiregrass, broomsedge, muhly grass, blazing star, butterfly weed, and asters.

The wet pine flatwoods occupy the flat terraces of the coastal plain that were historically covered by shallow seas. With the thick beds of sands deposited in this region, accumulated organic matter, aluminum, and iron form relatively impervious barriers. These barriers prevent water from percolating through the soil and lead to the development of perched water tables and saturated soils, particularly during the wet seasons of the year (winter/early spring). These hydric soils are commonly mottled in appearance due to the seasonal nature of soil saturation that leads to the oxidation and/or reduction of pockets of soil, resulting in the mixing of different soil types.

Wet pine flatwood habitat occurs in Davis Bayou in poorly drained silty loams. The wet pine flatwoods occur on the same soil type and are adjacent to wet pine savanna sites. The entire wet pine complex may have all been wet pine savanna habitat in the past. The presence of relatively large numbers of trees and shrubs that would normally be suppressed by periodic fire (e.g., loblolly pine, black gum, sweet bay magnolia) suggests that these sites have not experienced fire in some years. Although not common, some herbaceous species that are indicative of wet pine savannas are present in these sites (e.g., yellow top pitcher plant) and may be remnants of larger populations. Unless periodic fire is reintroduced to these sites, they will continue to exist in their present form and species diversity will continue to decline.

Nonnative Plant Species

The diverse habitats in Gulf Islands National Seashore host a wide variety of nonnative terrestrial and aquatic vegetation species. About 24 nonnative plant species are present in the national seashore, with new species introduced each year. These plants were introduced to the national seashore because of a variety of historic and modern circumstances, including exploration, shipping, recreational visitation, military activity, nearby development, construction, vehicular and boat traffic, and storms and ocean patterns. Most nonnative species at the national seashore are invasive, meaning they are of particular concern because of their ability to quickly infest large areas and their dramatic impacts on ecosystem dynamics and diversity. Many invasive plants are highly competitive at colonizing disturbed areas and have long-lived seed banks. These species are therefore well-equipped to take advantage of natural

disturbances such as those caused by storms and hurricanes, as well as human-caused disturbances such as construction zones, nondesignated trails, camping areas, and vehicle scarring in undesignated areas.

Management of invasive species at the national seashore is led by NPS staff under standard operating procedures. Mechanical removal is considered the primary method, while chemical control is a secondary method provided that certain requirements are met. Gulf Islands National Seashore actively collaborates with NPS exotic plant management teams, local municipalities, the state of Florida, and researchers from Florida and Mississippi to determine the best approaches to managing each nonnative species. Overall habitat and ecosystem health are the primary drivers of active nonnative plant management, while potential threats to species of concern are also considered during decisions about nonnative plant management activities.

Invasive plants of particular concern at Gulf Islands National Seashore include torpedo grass, cogon grass, lantana, Chinese tallow, and Japanese privet hedges. New occurrences such as kudzu, Japanese climbing fern, rattle box, and water hyacinth, are actively managed to control the size of emerging infestations. Chinaberry and mimosa are almost eradicated from the national seashore.

Repeated disturbance from recent hurricanes has exacerbated the persistence of many invasive plants, especially torpedo grass, cogon grass, and Chinese tallow. Construction activity in and near the national seashore is also a source of new infestations, as improperly sanitized vehicles and equipment can transport invasive plant seeds. National seashore users' vehicles and boats, and both regulated and unregulated visitor activities, are also sources of new infestations.

The urban interface with the national seashore is also a source of nonnative species such as pampas grass and Japanese honeysuckle. Although pampas grass is not particularly invasive, after the recent hurricanes many national seashore neighbors planted it as an ornamental; because it is not a natural component of the Gulf Islands ecosystem, staff are actively managing pampas grass occurrences in the national seashore.

Wildlife and Wildlife Habitat

Upland animal species are somewhat limited in number on barrier islands because of the lack of diversity in vegetation, difficulty of access from mainland areas, and the relatively small land area available on the barrier islands.

Common smaller native mammal species found in the Florida and Mississippi districts include marsh rabbit, eastern cottontail rabbit, opossum, squirrel, skunks, gray fox, raccoon, eastern wood rats, hispid cotton rats, eastern moles, southeastern pocket gophers, short-tailed shrews, and a variety of bats. River otters can also be found in the canals near Fort Pickens in Florida and in Horn and Petit Bois islands and Davis Bayou in Mississippi.

Gulf Islands National Seashore has more than 280 species of birds that use the islands for loafing, nesting, feeding, wintering, or migratory rest stops. These birds include songbirds, waterfowl, wading birds, birds of prey, marine birds, and shorebirds. Sandpipers, herons, egrets, ospreys, marsh wrens, terns, gulls, and several species of rails are just a few species that use the island habitats.

Shorebirds. Shorebird nesting, foraging, and loafing areas are along the north and south shorelines of all Florida District islands as well as along both the north and south shores of the Naval Live Oaks Area. In particular, shorebird colonies along Fort Pickens Road and J. Earle Bowden Way are managed through law enforcement, signs, and closures because the roads bisect breeding bird habitat, and pedestrians, bicycles, and vehicles impact these colonies. In addition, great blue heron and night heron nesting and roosting areas are located on Perdido Key and Santa Rosa Island. Osprey nest on Santa Rosa Island and in the Naval Live Oaks Area.

Horn and Petit Bois islands in the Mississippi District are important nesting areas for large colonies of least terns, sandwich terns, black skimmers, and royal terns. The largest nesting colonies of sandwich, royal, and gull-billed terns in the state are on Spoil Island, adjacent to Horn Island Pass. Gull-billed and Caspian terns, as well as numerous shorebirds, also nest on the Mississippi District islands. At least 14 species of waterfowl use these areas as wintering grounds, the most numerous being coot and scaup. Ospreys and eagles nest on Horn, Petit Bois, and East Ship islands in the slash pine habitats (NPS 2003c). Clapper rail, which is indigenous to salt marshes, and night heron nest and roost in Davis Bayou.

In addition, the national seashore implements seasonal closures that are reviewed on an annual basis to protect valuable shorebird habitat from impacts resulting from public use. These areas are used each year by nesting shorebirds. These closures are necessary to protect shorebirds, eggs, and chicks from human disturbance. Less restrictive measures would permit public access into areas where shorebirds build shallow, highly disguised nests in sand and deposit small, off-white colored eggs, which are extremely difficult to see, resulting in a high probability of the loss of wildlife.

The following locations are used by nesting shorebirds and are closed to all public use and access as indicated below (NPS 2003a):

- That portion of Santa Rosa Island, from the eastern end of Opal Beach to the national seashore boundary at Navarre Beach, which is designated by posted signs, from May 1 through September 30 of each year. (Florida District)
- That portion of Santa Rosa Island, from the national seashore boundary at Pensacola Beach to Fort Pickens Ranger Station, which is designated by posted signs, from May 1 through September 30 of each year. (Florida District)
- That portion of Perdido Key adjacent to the Johnson Beach Road, which is designated by posted signs, from May 1 through September 30 of each year. (Florida District)
- That portion of Spoil Island within the Mississippi District, which is designated by posted signs, from May 1 through September 30 of each year. (Mississippi District)
- The north shore of Horn Island encompassing the sand spit at the east side of the Big Lagoon entry, extending 1,500 yards to the east, which is designated by posted signs, from May 1 through September 30 of each year. (Mississippi District)
- The north shore of Horn Island approximately 0.5 mile west of the east tip, which is designated by posted signs, from May 1 through September30 of each year. (Mississippi District)
- The north shore of Horn Island at the mouth of Ranger Lagoon, which is designated by posted signs, from May 1 through September 30 of each year. (Mississippi District)
- The 0.25-mile section of the west tip of East Ship Island, excluding the beach, which is designated by posted signs, from May 1 through September 30 of each year. (Mississippi District)
- The area at the west tip of West Ship Island, from the western-most dune ridge to the western tip, excluding the surf line, which is designated by posted signs, from May I through September30 of each year. (Mississippi District)

Osprey and Bald Eagles. As with shorebirds, NPS staff implement seasonal closures to protect nesting osprey and bald eagles from visitor disturbance. These closures are necessary to protect osprey and bald eagle adults, eggs, and juveniles. These birds are subject to human disturbance, which can cause the adults to leave the nests and chicks to die from overheating and dehydration.

The following locations are closed to all public use and access as indicated below.

- From March 1 through July 31, the north shore of Horn Island in the area known as the Horseshoe, from NPS Marker #7 to NPS Marker #10, is closed as follows: The dunes and vegetated area from the northern base of the dunes to the marsh shall be closed to all entry and use. The beach shall be closed to camping, picnicking, or uses other than walking along the shoreline
- From March 1 through July 31, the area within 300 yards of each osprey nest that contains adult or juvenile osprey is closed to all public use.
- From October 1 through April 30, the area southeast of Big Lagoon on Horn Island, from NPS Marker #30A to NPS Marker #32, is closed as follows—The dunes and vegetated area from the southern base of the primary dunes for a distance 1,000 yards north of the dunes shall be closed to all entry and use. The beach shall be closed to camping, picnicking, or uses other than walking along the shoreline.

Amphibians and Reptiles. Common amphibians and reptiles found in the national seashore include the eastern glass lizard, anole, sand lizard, ground lizard, five lined skink, American alligator and the alligator snapping turtle (NPS 2003c). In addition, the national seashore provides habitat for four species of sea turtles, including Atlantic loggerhead, green, Kemp's Ridley, and leatherback. Because all these species are on the endangered species list, they are discussed in the later "Species of Special Concern" section.

Nonnative Wildlife Species

Nonnative wildlife species found in both districts include Norway rat, armadillo, coyotes, wild hogs, red fox, and black rat (NPS 2003b, 2003c). In the Mississippi District, nutria, an introduced rodent species that spends the majority of time in or near the water, is also present on Horn and Petit Bois, East Ship, West Ship, and Cat islands. Nutria decimated the sea oat population on these islands and required active control. Nonnative aquatic organisms, including jellyfish, clams, crabs, fish, snails, bacteria, and viruses have been introduced and continue to be introduced to Gulf waters from discharged ballast sediment and water used in the shipping industry. This practice presents international issues for exotic, nonnative introductions of potentially invasive and/or harmful organisms. Similar to the management of nonnative plant species, nonnative wildlife species are managed to benefit overall ecosystem health, and impacts on individual species are considered where appropriate.

Climate Change and Wildlife

Climate change is expected to have profound effects on wildlife because their biological cycles are so closely tied to temperature and their habitats. Birds, mammals, amphibians, and marine species are most likely to be affected in the national seashore. Bird migration patterns are already changing, with birds wintering in the southeast U.S. arriving on average 13 days earlier. Earlier breeding and egg laying dates and range expansion are already being seen in a variety of bird species. Expected sea level rise and increased storm activity may have detrimental impacts on the Perdido Key beach mouse by altering or restricting its habitat, food sources, and population size.

Because Gulf Islands National Seashore is home to both migratory and resident bird species, these effects are likely to be seen. Other documented impacts on predator-prey relationships and wildlife habitat in marine and terrestrial environments are already occurring, such as changes in the male/female ratio of sea turtles and amphibians. Sensitive species or species that that already have a reduced habitat range, such as the West Indian manatee, are especially vulnerable to the impacts of climate change (Loehman and Anderson 2009).

AQUATIC VEGETATION AND WILDLIFE

Submerged Aquatic Vegetation

Seagrass Beds. Seagrass beds grow throughout the protected seashore waters, where sandy bottoms, shell fragments, and calm waters provide the proper habitat. Seagrass beds occur in isolated patches usually less than several hundred acres in size. Seagrasses are very important in stabilizing bottom sediments and improving water clarity by trapping the fine particles that would otherwise remain suspended by wave and current action. Seagrasses bind shallow water sediments with their roots and rhizomes and baffle wave and current energy with their leafy canopy. In the turbid Mississippi Sound waters, the seagrasses are rarely found in water deeper than 6 feet, while in the clearer Florida waters of the Santa Rosa Sound, seagrass beds can be found in depths of up to 12 feet.

Seagrass communities form the basis of the food web in the marine ecosystem. In addition, they provide cover and important nursery habitat for many species. Although the grass beds make up only a small percentage of the total submerged lands around the national seashore islands, the fauna observed in association with them, especially the invertebrates, appears far greater than the more extensive sandy areas. The seagrass beds in Gulf Islands National Seashore and surrounding waters are vital nursery areas for Gulf of Mexico fisheries.

Dominate seagrass species found in Gulf Islands National Seashore waters include shoal grass, turtle grass, and manatee grass. Brackish water species that grow with these three dominant species in locations where saline concentrations are lower include widgeongrass, star grass, and tape grass.

Within the seagrass bed community at the national seashore are the following seven basic associations:

1. extremely sparse, pure stands of shoal grass
2. dense, pure stands of shoal grass
3. pure stands of manatee grass
4. pure stands of turtle grass
5. mixed beds of shoal grass and manatee grass
6. mixed beds of shoal grass and turtle grass
7. mixed beds of manatee grass and turtle grass

Mixed beds of all three species do not appear to be present. Widgeon grass, tape grass, and star grass are found in the more brackish water environments mixed in with the above associations depending on the specific location. Epiphytic algae are also a component of this overall community type.

Within Florida, seagrass beds grow in Big Lagoon, Pensacola Bay, and Santa Rosa Sound. Because of the extremely sensitive nature of some of these seagrass beds, portions of Big Lagoon and Santa Rosa Sound have been closed to motorized boat access by Gulf Islands National Seashore. These areas include Spanish Cove and Langley Point within Big Lagoon. Within Mississippi, seagrass beds generally grow on the sound side of all islands, and in limited areas within Davis Bayou. No boating restrictions are in

Across the entire Gulf Coast, the overall health of seagrasses and cover by seagrass beds has been declining for the past 60 years. All seagrass beds within the marine environment now managed by Gulf Islands National Seashore have extensively declined or in some cases have disappeared. The disappearance of seagrass and seagrass beds is attributed to increased turbidity caused by harbor and Intracoastal Waterway dredge and fill activities; boat traffic; shoreline modification; adjacent development leading to reduced water quality; and natural events such as tropical storms, hurricanes, and changes in salinity.

Because seagrass beds grow in relatively shallow water, boat traffic can either directly destroy grasses through propeller scarring or can indirectly impact grass beds by stirring up sediment from the ocean floor, creating increased turbidity. Dredging activities that keep shipping channels open also directly impact seagrass habitat by removing shallow sands and indirectly increase turbidity. Increased turbidity clouds the water and decreases light availability to seagrasses because of the suspended solids in the water column.

Water quality is affected by runoff from adjacent development, increasing both sediment and nutrient loads into Gulf waters as well as increasing suspended pollutants. Increased development in adjacent communities has been followed by increased stormwater runoff that carries sediment, nutrients, and pollutants. Nutrients come primarily from excess fertilizers used in agricultural operations and lawn care and from municipal wastewater discharges or leachate from individual septic fields. Because the balance between algae and seagrass is delicate and largely dependent on water quality, when levels of suspended nutrients are high, these algae can proliferate, causing "algal blooms" and thereby decrease sunlight availability necessary for seagrass growth. Other pollutants can have a toxic effect on individual seagrass beds.

Natural events that impact seagrass at Gulf Islands are primarily storms and changes in salinity. Before 1969, vast expanses of seagrass beds existed in the Mississippi Sound, but many of these beds were destroyed by Hurricane Camille and have never fully recovered. Hurricanes Opal, Ivan, Dennis, and Katrina all dealt substantial blows to recovering seagrass beds within Gulf Islands National Seashore in 1995, 2004, and 2005.

Collectively, impacts from both human sources and natural events have substantially changed species composition and decreased bed stands in some areas by as much as 80% since the 1950s or have completely destroyed certain beds. The seagrass community is very fragile and has been identified as a critical resource at Gulf Islands National Seashore.

Fish and Fish Habitat

More than 200 species of fish occur within the waters of Gulf Islands National Seashore. Because the estuarine and marine habitats (e.g., seagrass beds and unvegetated soft bottoms) encompassed within the two districts of the national seashore are similar and relatively close to each other, the following discussion applies to both districts, except where noted.

The most abundant fish are anchovies. Silversides are abundant in the shallow nearshore waters. These small species, among others, provide food for larger predators. The killifish, sailfin molly, and mosquito fish live in ponds and lagoons, and along the beaches. Myriad larval and young fish occupy the shallow waters around the islands and find food and protection in the seagrass beds. These include most of the important sport and commercial species that spawn further offshore and spend the early parts of their lives in estuarine nursery areas.

Several commercially and recreationally important species are within the waters of the national seashore. Speckled sea trout spawn around the islands and are often the most sought-after sport fish. The channel bass, sand sea trout, kingfish, jack, flounder, mackerel, bluefish, pompano, snapper, and many other species provide excellent surf and troll fishing. Cobia, locally known as lemon fish, and tarpon are among the large game fish. Mullet are also abundant.

Several species of sharks occur in national seashore waters, including hammerhead, bonnethead, Atlantic sharpnose, bull, and blacktip. Several species of rays, including Southern stingrays, manta rays, and spotted eagle rays, occur as well. Southern stingrays are the most abundant and commonly feed and rest in shallow waters.
Several species of shellfish that are of commercial, recreational, and ecological impor-

tance are in Gulf Islands National Seashore waters, including blue crabs, shrimp, and stone crabs. Water bottoms around the national seashore in the Florida and Mississippi District s are important nursery areas for most species of shellfish. Blue crabs are caught recreationally. Three species of shrimp (brown shrimp, white shrimp, and pink shrimp) occur at various seasons and life stages in seashore waters. Commercial shrimping is not allowed within the national seashore boundaries. Stone crab juveniles are common in the Pensacola Bay system waters, and Gulf stone crab adults and juveniles are common in Mississippi Sound waters. Bay scallops, whose range once extended to Pensacola, are now rare in areas west of St. Joseph Bay (FFWCC 2001).

Essential Fish Habitat. The 1996 Magnuson-Stevens Act requires cooperation among the National Marine Fisheries Service (NMFS), fishing participants, and federal and state agencies to protect, conserve, and enhance essential fish habitats. Essential fish habitat is defined as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (16 USC 1802(10)). Essential fish habitat occurs for several species of fish in the Florida and Mississippi districts of Gulf Islands National Seashore. Essential fish habitat has not yet been designated for most species occurring in the Gulf of Mexico (GMFMC 1998).

The National Oceanic and Atmospheric Administration's Estuarine Living Marine Resources Program developed a database on the distribution, relative abundance, and life history characteristics of ecologically and economically important fishes and invertebrates in the nation's estuaries. Based on these data, the administration has designated essential fish habitat for more than 30 estuaries in the northern Gulf of Mexico for a number of species of finfish and shellfish. Essential fish habitat occurs for several species of fish and shellfish in and around the national seashore waters (see table below).

TABLE 8: ESSENTIAL FISH HABITAT FOR KEY SPECIES IN PENSACOLA BAY AND THE MISSISSIPPI SOUND

Species	Pensacola Bay	Mississippi Sound
Brown Shrimp	X	X
Gray Snapper	X	X
Gulf Stone Crab	X	X
Pink Shrimp	X	X
Red Drum	X	X
Spanish Mackerel	X	X
Spiny Lobster		X
White shrimp	X	X

SOURCE: NOAA 2002a

Other invertebrates of ecological importance exist within the waters of Gulf Island National Seashore, although essential fish habitat has not been designated for these species. These species include horseshoe crab, mole crab, fiddler crab, hermit crab, coquina, several species of conch, oyster drill, and various copepods, isopods, and amphipods.

Fish, shrimp, and other marine species are especially sensitive to changes in water temperature and chemistry such as those anticipated due to climate change. Disruptions in the life cycles of these species, especially breeding and egg-laying, are already occurring due to climate change (Loehman and Anderson 2009, Ning et al. 2003). Disease outbreaks in ocean species, due in part to range expansion of marine parasites, are also occurring and are expected to increase as water temperatures rise. Because many shallow, stagnant coastal areas serve as marine "nurseries" for marine species, climate change may disrupt the health and food webs of these fisheries if it changes salinity, temperature, or oxygen and nutrient content these areas within the national seashore (Ning et al. 2003).

SPECIES OF SPECIAL CONCERN

Federally Listed Threatened and Endangered Species

The Endangered Species Act of 1973 prohibits harming any species listed by the U.S. Fish and Wildlife Service as being either threatened or endangered. Harming such species includes not only directly injuring or killing them, but also disrupting the habitat on which they depend. Section 7 of the act also requires federal agencies to consult with the U.S. Fish and Wildlife Service when any activity permitted, funded, or conducted by that agency may affect a listed species or designated critical habitat or is likely to jeopardize proposed species or adversely modify proposed critical habitat.

This section, along with the impacts analysis for the preferred alternative in Chapter 4 of this plan, fulfills the National Park Service's obligation under Section 7 to document federally listed species and impacts of the preferred alternative on these species via an embedded Biological Assessment.

Table 9 lists the threatened and endangered species in the national seashore, as well as species of concern in Florida and Mississippi. The process for determination of this list is described in Chapter 5: Consultation and Coordination. Different agencies have different categories for classification of species, as indicated in the heading and columns of Table 9. Note that "consideration encouraged" does not denote federally listed species, but a species that the U.S. Fish and Wildlife Service is concerned about and warrants special management attention.

Gulf Sturgeon. The Gulf sturgeon is a federally listed threatened species, and a species of special concern in Florida. This anadromous fish inhabits coastal rivers, bays, and the northern Gulf of Mexico from Louisiana to Florida. The U.S. Fish and Wildlife Service and National Marine Fisheries Service designated critical habitat essential to the conservation of the Gulf sturgeon in 2003. Overfishing throughout most of the 1800s and early 1900s resulted in a decline in Gulf sturgeon populations. This decline has been exacerbated by spawning habitat loss associated primarily with the construction of dams along Gulf Coast rivers.

In the early spring, adult Gulf sturgeon migrate from the Gulf of Mexico to spawn on the gravel substrates of coastal rivers. Eggs hatch after several days, and the young juveniles shelter upstream near sand ripples for their first year. After their first year, they move downstream and join older juveniles and adults for the spring migration. Adult and juvenile Gulf sturgeon remain in the rivers throughout the summer and migrate in to the Gulf of Mexico in the fall to overwinter.

In estuaries, Gulf sturgeon feed intensively around mudflats and oyster bars on benthic prey. Adults, particularly females, may swim more than 100 miles from the natal river during the winter feeding period, and wander widely on a temporal scale of weeks. Adults feed in passes between barrier islands and along the coast in 13 to 23 feet (4 to 7 meters) of water on sand substrate (USGS 2006).

Critical habitat for Gulf sturgeon extends along much of the Florida Panhandle, along coastal Mississippi and Alabama, and upstream into rivers that empty into the Gulf of Mexico.

Federally designated Gulf sturgeon critical habitat within Florida includes near-shore waters within 1 nautical mile of the mainland from Pensacola Pass to Apalachicola Bay, the Perdido Key Unit, and the area north of Santa Rosa Island. These locations are believed to be important migratory pathways between Pensacola Bay and the Gulf of Mexico for feeding and genetic exchange.

TABLE 9: LIST OF THREATENED AND ENDANGERED SPECIES WITHIN GULF ISLANDS NATIONAL SEASHORE

(E = endangered, T = threatened, SAT = similarity of appearance (threatened), DM = delisted, monitored, CH = Critical Habitat, SSC = Species of Special Concern, CI = Critically Imperiled, I = Imperiled, ce = consideration encouraged, R = Rare, SZ = zero occurrences)

Scientific Name	Common Name	Federal Status	Florida Status	Mississippi Status
Fish				
Acipenser oxyrhynchus desotoi	Gulf Sturgeon	T/CH	SSC	
Fundulus jenkinsi	Saltmarsh Topminnow		SSC	
Amphibians and Reptiles				
Alligator mississippiensis	American Alligator	SAT	SSC	
Caretta caretta	Loggerhead Turtle	T	T	CI
Chelonia mydas	Green Sea Turtle	E	E	
Dermochelys coriacea	Leatherback Turtle	E	E	
Drymarchon corais couperi	Eastern Indigo Snake	T	T	CI
Gopherus polyphemus	Gopher Tortoise	ce in FL T in MS	SSC	I
Lepidochelys kempii	Kemp's Ridley Sea Turtle	E	E	CI
Macroclemys temminckii	Alligator Snapping Turtle	ce	SSC	
Nerodia clarkii clarkii	Gulf Salt Marsh Snake	ce		
Pituophis melanoleucus mugitus	Florida Pine Snake	ce	SSC	
Rana capito sevosa	Dusky Gopher Frog	E		CI
Birds				
Aimophila aestivalis	Bachman's Sparrow	ce		
Athene cunicularia	Burrowing Owl		SSC	
Charadrius alexandrinus	Snowy Plover		T	CI
Charadrius alexandrines tenuirostris	Southeastern Snowy Plover	ce	T	
Charadrius melodus	Piping Plover	T/CH	T	
Cistothorus palustris marianae	Marian's Marsh Wren		SSC	
Dendroica dominica stoddardi	Stoddard's Yellow-Throated Warbler	ce		
Egretta caerulea	Little Blue Heron		SSC	
Egretta rufescens	Reddish Egret		SSC	
Egretta thula	Snowy Egret		SSC	
Egretta tricolor	Tricolored Heron		SSC	
Eudocimus albus	White Ibis		SSC	
Grus canadensis pulla	Mississippi Sandhill Crane	E		CI
Falco peregrinus	Peregrine Falcon	DM	E	
Falco peregrines tundrius	Arctic Peregrine Falcon	ce	E	
Falco sparverius paulus	Southeastern American Kestrel	ce	T	
Haematopus palliatus	American Oystercatcher		SSC	
Haliaeetus leucocephalus	Bald Eagle	DM	T	CI-I
Mycteria americana	Wood Stork	E	E	CI
Pandion haliaetus	Osprey		SSC	
Pelecanus occidentalis	Brown Pelican	DM	SSC	CI
Picoides borealis	Red-Cockaded Woodpecker	E	SSC	CI
Rynchops niger	Black Skimmer		SSC	

Scientific Name	Common Name	Federal Status	Florida Status	Mississippi Status
Sterna antillarum	Least Tern		T	R
Mammals				
Canis rufus	Red Wolf	E		
Peromyscus polionotus leucocephalus	Santa Rosa Beach Mouse	ce		
Peromyscus polionotus trissyllepsis	Perdido Key Beach Mouse	E/CH	E	
Plecotus rafinesquii	Southeastern Big Eared Bat	ce		
Trichechus manatus latirostris	West Indian Manatee	E	E	SZ
Invertebrates				
Plants				
Chrysopsis gossypina cruiseana	Cruise's Golden Aster	ce	E	
Cladonia perforata	Florida Perforate Cladonia	E	E	
Lupinus westianus	Gulf Coast Lupine	ce	T	

Gulf sturgeon critical habitat within Mississippi includes areas within 1 nautical of the barrier islands of the Mississippi Sound including areas near Gulf Islands National Seashore, which are believed to be important feeding habitat for gulf sturgeon. The passes (Ship Island Pass, Dog Keys Pass, Horn Island Pass, and Petit Bois Pass) are also designated critical habitat (68 FR 13369-13495, 19 March 2003).

American Alligator. Though the population of American alligator is considered fully recovered from its listing as an endangered species, it remains on the threatened species list due to its similarity of appearance with the endangered crocodile; its official listing status is "Threatened (Similarity of Appearance)". Because of its similarity in appearance to the crocodile, the U.S. Fish and Wildlife Service regulates the hunting and legal trade of alligator skins and products. It is a state species of special concern in Florida.

The American alligator is a large reptile reaching lengths of 6 to 12 or more feet and is blackish in appearance, with pale crossbands on the back and vertical markings on the sides. Alligators inhabit rivers, swamps, estuaries, lakes, and marshes in the southeastern United States from North Carolina to Texas. Both adults and young feed on a variety of animals, including fish, turtles, and other aquatic organisms.

In the Florida District, American alligator is present in wetlands in the Fort Pickens and Naval Live Oaks Areas. The national seashore occasionally receives reports of alligators sighted on the beach. The American alligator is capable of swimming in marine waters, as evidenced by its presence on the Mississippi barrier islands where it inhabits wetlands and brackish lagoons. The national seashore does not have any monitoring data for this species.

Sea Turtles. Four species of sea turtles occur in the waters of Gulf Islands National Seashore: the Atlantic loggerhead turtle, the green sea turtle, Kemp's Ridley sea turtle, and the leatherback turtle.

Each of these species is federally listed as threatened or endangered, and all have special status in Florida and/or Mississippi. Sea turtle populations have been adversely impacted because of the loss and alteration of nesting habitat, increased mortality from boat strikes, and entanglement in commercial fishing gear. Each year numerous adult and sub-adult sea turtles are found dead in the national seashore and surrounding waters. Other causes of death include ingestion of commercial fishing longline hooks and line, drowning in commercial fishing gear, and natural causes.

In the Florida District, sea turtles are primarily in Gulf of Mexico waters. Jellyfish are a common sea turtle prey item and may attract sea turtles into the Perdido Key Unit and the area north of Santa Rosa Island. Additionally, green turtles may be attracted to feed in the seagrass beds in the Perdido Key area and the area north of Santa Rosa Island.

Sea turtles are present in national seashore waters in the spring, summer and fall—until cold weather drives them to warmer southern waters. The national seashore does not have monitoring data on the abundance and distribution of sea turtles in national seashore waters. A loggerhead turtle satellite tagging program in the national seashore has revealed that the loggerhead population is most likely part of a distinct Gulf of Mexico population that is separate from the Atlantic population.

Sea turtles also nest on the beaches within the Florida District of the national seashore during the spring and summer months. The Florida District includes 21 miles of beaches suitable for sea turtle nesting. Most sea turtle nesting in the Florida District are loggerheads, although green turtles and Kemp's Ridley occasionally nest as well; Kemp's Ridley nesting has been improving in recent years. Averages of 40 to 50 sea turtles nest are laid in the Florida District annually. Nests are marked, dated, and watched by staff biologists and volunteers. About 60 days after nesting, the turtle hatchlings emerge from the sand and crawl toward the brightest horizon. Hatchlings in the Florida District often crawl in the wrong direction at night due to light pollution from the surrounding developed areas, resulting in high rates of hatchling mortality through predation and desiccation, so national seashore staff and volunteers steer the thousands of hatchlings to the sea. About one-fourth of sea turtle nests in the Florida District are relocated to higher ground because some turtles nest in areas that are vulnerable to flooding from hurricanes or strong southerly winds.

During the spring and summer in the Mississippi District, the loggerhead turtle nests on Horn, Petit Bois, and East Ship and West Ship islands, and they are regularly seen in Mississippi marine waters. The entire Mississippi District includes about 63 miles of beaches that are suitable for sea turtle nesting. Despite sporadic monitoring efforts, loggerhead nests are regularly documented in Mississippi. The leatherback is occasionally observed in national seashore waters, and a nest was documented on Fort Pickens in 2000. Sea turtles have been seen feeding on jellyfish near Petit Bois Island.

The rarest species of sea turtle globally, the Kemp's Ridley, is the sea turtle most frequently encountered in Mississippi's coastal waters. The Kemp's Ridley does not nest in Mississippi, but juveniles are regularly seen in both the Mississippi Sound and around the barrier islands, and a number have been accidentally captured in recent years by recreational fishermen on mainland piers (Mississippi Museum of Natural Science 2001). Green sea turtles are rarely observed in Mississippi.

Eastern Indigo Snake. The eastern indigo snake is a federally listed threatened species, and a species of concern in both Mississippi and Florida. The longest of North American snakes, it is heavy-bodied and shiny blue-black overall; its chin, throat, and sides of head are mottled with cream, orange, or red. Snakes grow from less than 2 feet at hatching to 5-7 feet as adults (Conant and Collins 1991, Smith and Brodie 1982). Eggs are normally laid in May-June.

Snakes range widely in warmer months, but in winter, snakes usually stay fairly close to a deep shelter. Habitat includes sandhill regions dominated by mature longleaf pines, turkey oaks, and wiregrass; flatwoods; most types of hammocks; coastal scrub; dry glades; palmetto flats; prairie; brushy riparian and canal corridors; and wet fields (Matthews and Moseley 1990, Tennant 1997, Ernst and Ernst 2003). Occupied sites are often near wetlands and are frequently in association with gopher tortoise burrows. Viable populations of this species require relatively large tracts of suitable habitat. Refuges include tortoise burrows, stump holes, land crab burrows, armadillo

burrows, or similar sites. Eggs may be laid in gopher burrows (Ashton and Ashton 1981).

Decline is attributed to loss of mature longleaf pine habitat (e.g., suppression of wildfire, conversion to slash and sand pine plantation, urbanization, citrus agriculture, mining, etc.), commercial collecting for pet trade (now illegal and has declined), and former widespread gassing of tortoise burrows (to collect rattlesnakes). In northern Florida and adjacent southern Alabama and Georgia, important habitat for the indigo snake has been lost with the decline in the gopher tortoise population (fewer burrows are available) and the removal of stumps by the resinous wood industry; elsewhere, habitat fragmentation is a problem (Moler 1992).

Historical range of this snake extended throughout the lower Coastal Plain of the southeastern United States, from southern South Carolina through Georgia and Florida to the Florida Keys, and west to southern Alabama and perhaps southeastern Mississippi. Current range includes southern Georgia (most common in the southeast; see Diemer and Speake 1983) and Florida (widely distributed throughout the state, south to the Keys, though perhaps very localized in the panhandle; Moler 1985, 1992; see also Ballard 1992). The species is apparently very rare or extirpated in Alabama, Mississippi, and South Carolina. Recent reintroductions have been made in Florida, Alabama, Georgia, South Carolina, and Mississippi. One reintroduced population may be thriving in Covington County, Alabama (NatureServe Explorer 2010).

This species may be present in Gulf Islands National Seashore, and abundance and residency are unconfirmed. Therefore, this species is dismissed from further analysis.

Gopher Tortoise. This species is federally listed as threatened in Mississippi and Alabama, but not Florida; however, individuals have been found in the Florida District but not the Mississippi District of the national seashore. The gopher tortoise is a species of special concern in both Florida and Mississippi. Habitat loss is the largest threat to the species. Gopher tortoises are known to occur in inland locations of mainland areas in the Florida District of the national seashore.

Populations in some areas have been severely reduced, including in the region of the national seashore. Gopher tortoises are not known to inhabit the Mississippi District at present.

The gopher tortoise is a large (the shell is 5.9 to 14.6 inches long), dark-brown to grayish-black terrestrial turtle with elephantine hind feet and shovel-like forefeet.

Disjunct populations occur from extreme eastern Louisiana east through southern Mississippi and Alabama to the Atlantic Coast, and from extreme southern South Carolina through central and southern Georgia and Florida. Gopher tortoises tend to dig burrows in open and sunny areas that have patches of bare ground. They inhabit dry areas where sandy, well-drained soils persist and avoid wet, swampy areas where the water table is less than 3 feet (1 meter) below the surface. Nests are located from just above high tide to 330 feet (100 meters) in elevation. Gopher tortoises inhabit plant communities that have remained undisturbed for up to about 11 years. As shade increases with community succession, the number of tortoises decreases.

Threats to the gopher tortoise are predominantly related to habitat loss, including real estate development, agriculture, mining, and forestry. Relocation of tortoises can be successful in rehabilitated forest and mine lands or in areas where they have been eradicated due to fire exclusion. The gopher tortoise is considered a keystone species because more than 80 species live in and rely on its burrow for protection. Some of these species are rare, such as the dusky gopher frog (*Rana areolata*), the pine snake (*Pituophis melanoleucus*), and the indigo snake (*Drymarchon corais*). By burrowing, gopher tortoises aid in returning leached nutrients to the soil surface. (U.S. Forest Service 1991)

Alabama Red-Bellied Turtle. The Alabama red-bellied turtle is a federally listed endangered species, and a critically imperiled listed species in Mississippi. However, this species is unconfirmed in Gulf Islands National Seashore, and is dismissed from further analysis because it is not part of the project area.

Dusky Gopher Frog. The dusky gopher frog is a federally listed endangered species and a critically imperiled listed species in Mississippi. However, this species is unconfirmed in Gulf Islands National Seashore, and is dismissed from further analysis.

Piping Plover. The piping plover is a federally listed threatened species as well as a state listed threatened species in Florida. Parts of the national seashore have been designated critical wintering habitat. Habitat is concentrated in open beaches and tidal flats, and piping plovers begin arriving in July and remain into the following May. Surveys for the piping plover have been systematically carried out in the past several years. Within the Florida District, piping plovers are known to winter in tidal flat areas on Perdido Key and on the north side of Santa Rosa Island.

The piping plover holds Mississippi state status in addition to its federally threatened status and habitat is located in open beaches and tidal flats throughout the district. Critical habitat for wintering piping plover has been designated on many Mississippi barrier islands, including Cat, East and West Ship, Horn, and Petit Bois islands in the national seashore.

Mississippi Sandhill Crane. The Mississippi sandhill crane is federally listed as an endangered species, and is a species of concern in Mississippi. This large, relatively slender crane has grey to brownish grey coloration and a long neck and legs.

The Mississippi sandhill crane is not migratory and is a subspecies of the migratory sandhill cranes of the Arctic, Midwest, and West Coast. Once an inhabitant of the Gulf Coastal Plain of Louisiana, Mississippi, and Alabama, it is now found only in a small area west of the Pascagoula River in Jackson County, Mississippi. Davis Bayou is close to the Mississippi Sandhill Crane National Wildlife Refuge and historically may have provided habitat for this species.

The Mississippi sandhill crane inhabits coastal pine savannas as well as associated bays and swamps. These areas are seasonally wet, open to semi-open herbaceous communities dominated mainly by grasses and sedges with scattered, often poorly formed shrubs and trees. Cranes use the open wet pine savannas for loafing, nesting, and roosting.

The main threats to this species include habitat destruction, urban growth and development, and hunters. The recent increase in the number of coyotes in sandhill crane habitat may become a threat, because coyotes and other predators destroy both eggs and young cranes (Mississippi Museum of Natural Science 2001).

Red-Cockaded Woodpecker. The red-cockaded woodpecker is a federally listed endangered species, and is a species of special concern in Florida. This species may be present in Gulf Islands National Seashore, but is unconfirmed, and abundance and residency are unknown. Therefore, this species is dismissed from further analysis.

Wood Stork. The federally listed engendered wood stork is a large, long-legged wading bird with a wingspan of up to 65 inches. It is also state listed as endangered in Florida, and critically imperiled in Mississippi. It has predominantly white plumage with a short black tail.

Small fish from 1 to 6 inches long, especially topminnows and sunfish, are this bird's primary diet.

The current population of adult birds is difficult to estimate because not all nest each year. Currently, the wood stork breeding population is believed to be greater than 8,000 nesting pairs (16,000 breeding adults). Nesting has been restricted to Florida, Georgia, and South Carolina; however, they may have

formerly bred in most of the southeastern United States and Texas. A second distinct, nonendangered population of wood storks breeds from Mexico to northern Argentina. The wood stork is occasionally present at Gulf Islands National Seashore.

Storks from both populations move northward after breeding, with (1) birds from the southeastern United States population moving as far north as North Carolina on the Atlantic coast and into Alabama and eastern Mississippi along the Gulf Coast, and (2) storks from Mexico moving up into Texas and Louisiana and as far north as Arkansas and Tennessee along the Mississippi River Valley.

Storks are birds of freshwater and estuarine wetlands, primarily nesting in cypress or mangrove swamps. They feed in freshwater marshes, narrow tidal creeks, or flooded tidal pools. Particularly attractive feeding sites are depressions in marshes or swamps where fish become concentrated during periods of falling water levels (USFWS 2005).

Brown Pelican. The brown pelican is a year-round resident of the Mississippi District in the national seashore. The brown pelican is has recently been delisted, but it continues to be monitored. It is also a state listed, critically imperiled (nonbreeding), species in Mississippi and is a state species of special concern in Florida.

In the Mississippi District of the national seashore, the brown pelican inhabits the Davis Bayou Area, East Ship and West Ship islands, Horn Island, Petit Bois Island, and Cat Island (MDMR 2004).

The brown pelican feeds primarily in shallow waters within 20 miles of the shoreline, rests during the day, roosts at night on sand spits and offshore sand bars, and nests on small coastal islands that provide protection from mammal predators and have sufficient elevation to prevent flooding of nests (USFWS 2003c). Pesticide residue (DDT) in prey species (fish) was a primary factor in the decline of the species. Other threats include oil or chemical spills, plant community changes, storms, heavy tick infestations, and inconsistent food availability. Human-caused disturbance of nesting colonies and mortalities related to fishing activities are also threats (USFWS 2003c).

Red Wolf. The red wolf is federally listed as an endangered species. It is a separate species from the other wolf found in the United States and elsewhere—the gray wolf. The red wolf got its name from the reddish color of the head, ears, and legs. However, its coloring can range from very light tan to black. Weighing 45 to 80 pounds, the red wolf is smaller than the gray wolf and larger than the coyote. The red wolf's most distinguishing features are the long ears and legs. The biggest threats to the red wolf are habitat loss, hunting, and inbreeding with coyotes and other canids.

Originally, the red wolf roamed as far north as Pennsylvania and as far west as central Texas. Like its relative the gray wolf, the red wolf was extirpated from its former range by large-scale predator control programs. By the late 1930s, only two populations are believed to have remained—one in the Ozark/Quachita Mountain region of Arkansas, Oklahoma, and Missouri, and the other in southern Louisiana and southeastern Texas. Nearly extinct only a few decades ago, the red wolf has begun to recover with the help of captive breeding and reintroduction programs.

The U.S. Fish and Wildlife Service established a captive breeding program for the red wolf in 1973. Biologists began to remove remaining red wolves from the wild in an effort to save the species from extinction. These animals were taken to the Point Defiance Zoo and Aquarium in Tacoma, Washington. During a period of six years, more than 400 wolf-like canids were captured in Louisiana and Texas, but of this number, only 43 were considered red wolves and were placed in captivity. Further, breeding experiments revealed that only 17 of the 43 were true red wolves, and only 14 of these successfully bred in captivity. By 1980, the red wolf was considered extinct in the wild.

Early releases of red wolves at Alligator River National Wildlife Refuge, North Carolina, resulted in high mortality, and some animals exhibited a tolerance of people considered to put them at risk because of potential conflict with human activities. Therefore, several island projects were established to serve as pre-reintroduction sites where the wolves could have their first experience in the wild with limited human contact. Wolves placed on these islands have reproduced, and the packs roam freely on the islands or were restricted to large enclosures. The adults and/or young are subsequently captured and used in reintroduction projects such as the one at the Alligator River refuge. Bulls Island in the Cape Romain National Wildlife Refuge in South Carolina, Horn Island in the Gulf Islands National Seashore in Mississippi, and St. Vincent National Wildlife Refuge in Florida are the three island sites were used as pre-reintroduction sites to rear young red wolves.

In the late 1990s, Horn Island was discontinued as a reintroduction site due to the potential for interaction between humans and wolves. There are no red wolves on Horn Island or elsewhere in Gulf Island National Seashore. The U.S. Fish and Wildlife Service staff are working with the U.S. Forest Service staff to evaluate national forest lands in the Southern Appalachians and elsewhere that may be suitable as future reintroduction sites (USFWS 1995).

Because the red wolf is no longer present on Horn Island, and because there are no current plan for future reintroductions on any of the islands in the national seashore, impacts on the red wolf are considered not applicable to this analysis.

Perdido Key Beach Mouse. The Perdido Key beach mouse is both a federally listed and state listed endangered species in Florida. Historically, its habitat was mature coastal barrier sand dunes along the Gulf of Mexico, but it is only present currently in the eastern part of Perdido Key, with critical habitat designated within the Perdido Key Unit of the national seashore, Perdido Key State Park in Florida, and the Gulf State Park in Alabama. Tropical storms and loss of habitat due to development and habitat fragmentation are the main contributing factors to the current status of the Perdido Key beach mouse (NPS 2003b). The installation of dune crossovers on Perdido Key was due to an agreement with the U.S. Fish and Wildlife Service. The dune crossovers throughout the national seashore protect the Perdido Key beach mouse and its habitat by limiting visitor impacts on designated areas of the dunes.

West Indian Manatee. The West Indian manatee is federally listed as endangered, and has special status in both Florida and Mississippi. The Florida manatee, a subspecies of the West Indian manatee, is a large gray or brown aquatic mammal native to the United States in Florida, Georgia, and Puerto Rico. Manatees are found in shallow rivers, estuaries, and inshore coastal areas where they feed on seagrasses and other aquatic vegetation. Adult manatees average 10 feet long, weigh 1,000 pounds, and can consume nearly 10% of their body weight in aquatic plants daily (USFWS 2003c). During the winter, manatees migrate to the warmer waters of south Florida or form large aggregations in natural springs and industrial outfalls where water temperatures are elevated.

Population decline because of the direct and indirect effects of human activities is one of the greatest threats to the manatee. Manatees, as air-breathers, spend much time at the water surface and feeding and resting in shallow seagrass beds; they cannot always dive quickly or deeply enough to avoid being struck by boats. Over the past decade, more than 30% of manatee deaths were human-related, primarily from collisions with boats, but also including entanglement in commercial fishing gear and being crushed in canal locks and floodgates (FFWCC 2007). A major factor in the decline of the manatee population has been the loss of seagrass beds because of impacts on coastal waters of the northern Gulf of Mexico related to human development. Natural manatee mortalities have been attributed to strong cold weather fronts and toxic red tide blooms. During the 2003 annual manatee count in Florida, 1,299 manatees

were counted along Florida's Gulf Coast (Florida Marine Research Institute 2003).

In the Florida District, most manatee sightings are in the waters of the Gulf of Mexico, though some individuals have been documented in Pensacola Bay and likely some in the area north of Santa Rosa Island and the Perdido Key Unit. Currently, the national seashore does not monitor for the species. Manatees are present in national seashore waters in late spring and summer when water temperatures range from the upper 70s to low 80s Fahrenheit.

In the Mississippi District, manatees occur along the mainland side of Mississippi Sound and are rare or absent around the barrier islands, although dead manatees have washed up on the beaches of the barrier islands.

Florida Perforate Cladonia. This species, also known as the perforate reindeer lichen, is a federally listed endangered species and a state listed endangered species in Florida. It is found in the well-drained sands of rosemary scrub habitat. The 2007 5-Year Review by the U.S. Fish and Wildlife Service for this species found no sites that support the Florida perforate cladonia in Gulf Islands National Seashore (USFWS 2007). Therefore, it has been dismissed from further analysis.

Other Special Status Species

Florida and Mississippi both maintain lists of species of state concern. Some of these species are described below if they are of particular interest at the national seashore; for example, important habitat is found in the seashore. Also included are species of concern to the U.S. Fish and Wildlife Service and National Marine Fisheries Service, but that are not federally listed species to which Section 7 of the Endangered Species Act applies. These species, termed "consideration encouraged" or "species of concern" are recommended for consideration by federal agencies undertaking management actions. They are *not* species officially designated as candidate species for Section 7 protection.

Saltmarsh Topminnow. The saltmarsh topminnow is a small fish native to the north-central coast of the Gulf of Mexico of the southern United States, from Galveston Bay, Texas, eastward through Louisiana, Mississippi, Alabama, and parts of western Florida. It is a federal species of concern managed by the National Marine Fisheries Service, and it is listed as species of special concern by Florida. Because the saltmarsh topminnow lives in salt marshes and brackish water, coastal erosion and conversion of marshes to deeper, open water eliminates the marsh surface that, when flooded, provides important feeding, shelter, and possible breeding areas for saltmarsh topminnows. The saltmarsh topminnow is believed to live in the Pensacola Bay system (NMFS 2003) and is also likely to live in the wetlands and marshes of the Mississippi barrier islands.

Gulf Salt Marsh Snake. The Gulf salt marsh snake is a species whose consideration is encouraged by the U.S. Fish and Wildlife Service. It has no special status in Florida or Mississippi. The average adult size of this snake is 15–20 inches (38–51 centimeters). Adults are grayish with four dark longitudinal stripes on their body, two on each side.

This snake is found along the Gulf coast in brackish and saltwater estuaries, salt marshes, and tidal mud flats from central Florida to southern Texas. It can be found hiding in tidal wrack along the shore and sometimes is seen inhabiting crab burrows in the sand or mud. It feeds on small fishes, crabs, shrimp, and other invertebrates trapped in isolated pools of water by the falling tide.

The Gulf salt marsh snake is active mainly at night, though its activity patterns may be affected by tidal patterns and seasons.

Threats to the Gulf salt marsh snake include destruction or severe alteration of coastal habitat throughout most of its geographic range, and hybridization between *Nerodia clarkii* and the invasive species banded water snake (*N. fasciata*), leading to diminished genetic integrity of both species (Gibbons et al. 2004).

Gopher Frog. The gopher frog is a species of special concern in Florida, and consideration of this species is encouraged by the U.S. Fish and Wildlife Service. However, this species is unconfirmed in Gulf Islands National Seashore, and is dismissed from further analysis.

Bachman's Sparrow. This sparrow is a large (5.9–6.3 inches or 14–16 centimeters) sparrow with a large bill, fairly flat forehead, long dark rounded tail, and gray upperparts that are heavily streaked with chestnut or dark brown. The Bachman's sparrow is recommended for consideration by the U.S. Fish and Wildlife Service.

This sparrow winters mainly in habitats with dense grassy cover, mostly under open pine woods, and also in grassy fields, such as broomsedge (Hamel 1992) and scrub oak, and along fence rows. The Bachman's sparrow has been recorded in riparian habitats and sometimes along the saltwater shores of coastal woodlands (Burleigh 1958, Bent 1968, Sprunt and Chamberlain 1970, LeGrand and Schneider 1992).

Its diet consists of insects, other invertebrates, and seeds of herbaceous plants and pines (Meanley 1959, Sprunt and Chamberlain 1970, Oberholser 1974, Allaire and Fisher 1975). This bird forages on the ground and in dense grass, palmettos, or shrubs (Hamel 1992). Nestlings are fed insects (Meanley 1959).

Habitat loss and predation are the major threats to Bachman's sparrow. Conversion of longleaf pine stands to plantations of fast-growing pines, shortage of newly abandoned farmland, and urbanization apparently are important factors in the population decline (Dunning 1993). At least 90% of this bird's original habitat (mature pine forests in the South) has been severely altered by conversion of natural forest to pine plantation or other forms of alternative land use. Isolated patches of habitat are less likely to support populations. The practice of fire suppression continues to negatively affect Bachman's sparrow habitat by increasing the understory and shrubby vegetation. The Bachman's sparrow is also affected by harvest rotations that maintain unsuitable timber age classes (i.e., 15–70 years old).

Nestlings and eggs may be eaten by snakes or mammals, but there are no records of adult mortality due to predation (Dunning 1993). In one study, predation caused more than 90% of nestling mortality, compared to disease and starvation (Haggerty 1988, cited in Dunning 1993; NatureServe Explorer2010).

Southeastern Snowy Plover. The southeastern snowy plover is a year-round resident of the national seashore, and is a state listed threatened species in Florida. It is found on Perdido Key, Fort Pickens, and Santa Rosa in Florida, and in Mississippi, it is found on East and West Ship islands, Horn Island, Petit Bois Island, and Cat Island.

Beaches; dry mud or salt flats; and the sandy shores of rivers, lakes, and ponds are the normal habitat for this plover. It nests on the ground of broad open beaches where vegetation is sparse or absent. Nests are often subject to flooding, and the plover faces threats from loss of habitat due to beach development (NatureServe Explorer 2010). In 2001, 30 southeastern snowy plover nests were monitored—13 on Perdido Key and 17 in the Fort Pickens Area (NPS 2003b). Feeding and loafing areas are also present on the western side of the Santa Rosa Area (FDEP 2003c).

Stoddard's Yellow-Throated Warbler. This warbler has a yellow throat and upper breast, white belly with black streaks, two white wing bars, large white patches on each side of the neck, and a dark tail (NGS 1983). Its habitat is pine forest, sycamore-bald cypress swamp, riparian woodland, and live oak woodland. During the winter, it can be found in various woodland, scrub, and thicket vegetation, but it prefers pine woodland if available (AOU 1983). The Stoddard's yellow-throated warbler nests in Spanish moss (*Tillandsia usneoides*) when available. The warbler's forages high in trees for insects and spiders, and also catches insects in flight.

The breeding range of the Stoddard's yellow-throated warbler is a narrow strip (100 miles by less than 20 miles) along the Gulf Coast from Baldwin County, Alabama, to Bay County, Florida. Development along the Gulf Coast and pesticide use are both factors considered to have adverse effects on this species and other insectivorous birds; the U.S. Fish and Wildlife Service breeding bird surveys indicate a sharp decrease in population of this species after 1971 in Florida (NatureServe Explorer 2010).

Peregrine Falcon. The peregrine falcon was delisted from federal list of threatened and endangered species in 1999 and is currently monitored to ensure continued recovery. It is listed as endangered by Florida. Peregrines are routinely observed on beaches during the winter and fall.

The peregrine falcon is a winter resident in the area and can be seen on all Mississippi District islands from fall to spring.

Arctic Peregrine Falcon. The Arctic peregrine is the palest of the North American subspecies of peregrine falcon, and it also is slightly smaller than the others. This species is state listed as endangered in Florida and is recommended for consideration by the U.S. Fish and Wildlife Service, but it is not federally listed.

Arctic peregrines migrate through the Gulf of Mexico twice a year to and from their wintering areas in South America. They stop on the Gulf Coast to feed before continuing their migration. The Arctic peregrine nests in the Arctic islands and the tundra regions of Alaska, Canada, and Greenland (Texas Parks and Wildlife Department 2008a).

Southeastern American Kestrel. The southeastern American kestrel is a state listed threatened species in Florida and is recommended for consideration by the U.S. Fish and Wildlife Service. Habitat consists of open or partly open areas, although during winter in Florida males use less open habitats than do females. Kestrels nest in the cavities of tall dead trees or in telephone poles. Fluctuation in species numbers is attributed to habitat destruction and loss of nest sites, as well as predation and pesticide use (NatureServe Explorer 2010).

Least Tern. The least tern is a state listed threatened species in Florida and is state listed rare or uncommon (breeding) species in Mississippi. The least tern is present on East and West Ship islands, Horn Island, Petit Bois Island near the west end, and Cat Island (MDMR, 2004). It nests near water, particularly on seacoasts, beaches, bays, estuaries, lagoons, lakes, and rivers. The least tern rests and loafs on sandy beaches, mudflats, and salt-pond dikes.

The least tern is susceptible to human disturbances, predation, flooding, and loss of habitat (NatureServe Explorer 2010). Colonies establish and reestablish along the length of the islands, because least terns will nest wherever suitable habitat exists and will relocate when habitat disturbances occur. In the early 1990s, Perdido Key supported a large colony of least terns near the eastern tip, but after Hurricane Opal the populations at Fort Pickens and Santa Rosa increased dramatically.

Black Skimmer. The black skimmer is a state listed species of concern in Florida. Primary habitat for the black skimmer is coastal waters, including beaches, bays, estuaries, and sandbars, as well as tidal creeks that are used for foraging. It primarily nests on sandy beaches, small coastal islands, and dredge spoil islands (Hipes et al. 2001). Within the national seashore, black skimmers share colony sites with least terns. Nesting colonies are on East and West Ship islands, Horn Island, and Cat Island.

Like the least tern, the black skimmer locates and relocates colonies based on environmental changes and disturbances. In the year 2000 there were approximately 18 black skimmer nests in the Santa Rosa Area, while in the year 2001 there were three. In the Fort Pickens Area, two nests were documented in 2000; 47 nests in 2001; and 38 nests in 2002.

Reddish Egret. The reddish egret, a state listed species of concern in Florida, has been identified within the national seashore as an uncommon and occasional migratory species. The reddish egret is generally found in shallow water areas that are saline, hypersaline, or brackish within coastal habitats, including barren sand or mud tidal flats, salt ponds, lagoons, and open red mangrove and black mangrove communities. It occasionally feeds in other habitats, including coastal beaches, sparsely vegetated freshwater marshes, and the shores of lakes and reservoirs. Habitat loss and human disturbance are the main factors in the decline of the species (NatureServe Explorer 2010).

Little Blue Heron. The little blue heron is a state listed species of concern in Florida. It is found primarily in freshwater habitats in marshes, ponds, lakes, meadows, mudflats, lagoons, streams, mangrove lagoons, and other bodies of calm shallow water. It nests in trees and shrubs to about 13 feet (4 meters) above ground or water, often with other herons, egrets, and ibises. The primary threat to populations is disturbance and development of nesting areas, in addition to weather and shoreline variability (NatureServe Explorer 2010). The little blue heron is rarely observed in the Naval Live Oaks Area, and is likely only migratory in the area because nesting activity has not been confirmed within the national seashore.

Snowy Egret. The snowy egret is a state listed species of concern in Florida. It is found in marshes, lakes, ponds, lagoons, mangroves, and shallow coastal habitats. It often nests with other colonial water birds in trees or shrubs, and occasionally on the ground or in marsh vegetation. The main threat to the snowy egret is from loss and degradation of wetland habitats (NatureServe Explorer 2010). The snowy egret is not known to nest within the national seashore, but it is found within national seashore saltmarsh environment).

Santa Rosa Beach Mouse. The Santa Rosa beach mouse is found only on Santa Rosa Island in Florida. It is not federally listed, but the U.S. Fish and Wildlife Service encourages its consideration by federal land managers. It inhabits both beach and interior dunes that are vegetated with sea oats and other typical vegetation. Human destruction of habitat and predation by introduced species are potential threats to populations (NatureServe Explorer 2010). There are a total of three known populations at the extreme ends and middle of the island (NPS 2001).

Rafinesque's (Southeastern) Big-Eared Bat. The Rafinesque's big-eared bat is a medium-sized bat with long, rabbit-like ears (1.06-1.46 inches or 27-37 millimeters). The U.S. Fish and Wildlife Service encourages federal agencies to consider this species during management planning, though it is not federally listed. This bat has large facial glands protruding from each side of its snout. Its fur is grayish brown above and conspicuously bi-colored underneath. Also known as the southeastern big-eared bat, this bat is found along the Gulf Coast from Texas to Florida and north to Virginia.

Although other bat species are crepuscular (active during twilight hours), Rafinesque's big-eared bats are nocturnal (become active when it is completely dark). Like others in the order Chioptera, these bats eat only insects. Their diet consists of mostly moths, but Rafinesque's big-eared bats will consume mosquitoes, beetles and flies as well. Predators that feed on the bat include snakes, raccoons, opossums, and domestic (and feral) cats.

Mating season is in the fall. Rafinesque's big-eared bats hibernate during the winter. During the late spring, however, pregnant females leave the males and nonreproductive females and establish nursery colonies to give birth and raise their young. Adult females have one pup each year, born in late May or early June. The pups are able to fly three weeks after birth.

Rafinesque's big-eared bats roost in cave entrances, hollow trees, abandoned buildings, and under bridges in the forests of south-eastern United States. Most Rafinesque's big-eared bats originally required large hollow

trees. Throughout their range, many such roosts have been lost. The relatively few remaining colonies now survive mostly in lowland tree hollows that are subject to flooding, or in abandoned buildings that are prone to human disturbance and structural collapse from decay.

Protection of large hollow trees in lowland areas, especially near water sources, is essential to the preservation of this species. Artificial roosts might be required to provide crucial alternatives in areas where hollow trees and abandoned buildings have been removed (Texas Parks and Wildlife Department 2008b).

Cruise's Golden Aster. Cruise's golden aster is a state listed endangered species in Florida, but is sometimes locally abundant in dune communities with nutrient-poor, well-drained sandy soil. It faces threats due to development and consequent habitat loss (NatureServe Explorer 2010). It is found throughout the Florida District, though not in large numbers. Within the national seashore, the plants are threatened by foot traffic. Habitat ranges from coastal grasslands, small dunes, dune ridges, tall dunes with rosemary, and scrub.

Gulf Coast Lupine. Gulf Coast lupine is a state listed threatened species in Florida, and its consideration is encouraged by the U.S. Fish and Wildlife Service. Though it is a species of concern, it can be locally abundant. The main threat to species survival stems from development and consequent loss of habitat (NatureServe Explorer 2010). Lupine found within the national seashore was determined not to be Gulf Coast lupine, though Gulf Coast lupine does occur in pockets nearby in Escambia and Santa Rosa counties.

Species of special concern, regardless of listing status, are especially vulnerable to changes in habitat, water quality, air and water temperature, and other anticipated effects of climate change on the Gulf Coast. For example, sea-level rise and increases in severe weather may erode or destroy the mature barrier island dunes that are important habitat for the Perdido Key beach mouse. Also, nesting success and the male/female ratio of endangered sea turtles may change if sea surface and air temperatures rise as anticipated. Habitat quality for the piping plover, wood stork, or Mississippi sandhill crane may be degraded as the combined effects of climate change modify marsh or coastal vegetation that serves as habitat for the species and their food sources.

VISITOR USE AND EXPERIENCE TOPICS ANALYZED IN DETAIL

Gulf Islands National Seashore, the largest seashore in the national park system, provides the public with access to barrier islands, historic coastal fortifications, and a bayou. The sugar-white sands and clear, warm, blue-green waters of the Gulf provide local residents and visitors with an outdoor oasis and welcome visitors from all over the world. The undeveloped beaches provide outdoor recreational opportunities stretching 160 miles—from Okaloosa, Florida, to Cat Island, Mississippi. The waters, beaches, fertile coastal marshes, forests, submerged lands, and wildlife in the national seashore provide a stark contrast to the rapidly growing coastal communities and major population centers along the northern Gulf of Mexico coastline.

The national seashore also provides opportunities to learn about and explore almost 150 years of coastal fortifications—from the Spanish colonial Bateria de San Antonio (1797) to the World War II-era Battery 234. Most striking among these are the American Third System forts—Fort Pickens, Fort Massachusetts, Fort Barrancas, and the Advanced Redoubt—all of which saw action during the Civil War. At the national seashore visitor centers, the public can learn about the early human occupations of lands within the national seashore before the Spanish arrived in 1559.

Visitors have the opportunity to experience wilderness solitude on two barrier islands within the national seashore. In 1978 Congress designated Horn and Petit Bois islands as wilderness areas, thus protecting two of the last undisturbed barrier islands along the Atlantic Ocean and Gulf of Mexico.

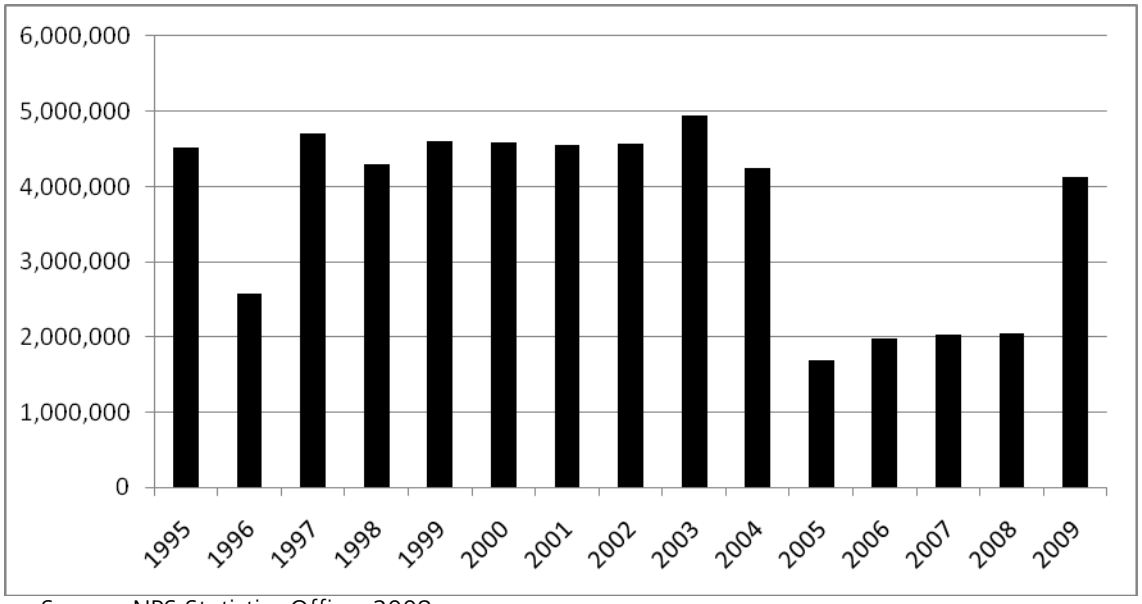
VISITATION

The national seashore is the most heavily visited seashore in the national park system, and it is one of the 10 most visited park units in the park system. The national seashore is the closest coastal beach to most of the nation's midsection, so beach use is the primary recreational experience of most visitors. Cultural and historical features are also major visitor attractions. Most visitors come from within a 500-mile radius, including the states of Georgia, Alabama, Florida, Mississippi, Tennessee, Louisiana, Texas, and Arkansas.

Changes in annual visitation and visitation patterns to the national seashore are influenced by hurricanes and other strong coastal storms. Hurricanes can close bridges and destroy piers, beaches, and visitor facilities. Table 10 highlights the influences by displaying the decline in visitation following various hurricanes. In October 1995, Hurricane Opal destroyed numerous seashore facilities and roads and thereby limited visitor access and recreational opportunities in 1996. In an 11-month period, beginning with Hurricane Ivan in September 2004, the national seashore was damaged by four hurricanes and two tropical storms. Each hurricane and tropical storm interrupted and impacted the reconstruction efforts and created barriers that limited visitor access and use at the national seashore. As a result, visitation numbers were lower four years in a row after the hurricanes and tropical storms. Annual visitation rebounded in 2009 to near pre-storm levels.

For the seven years between Hurricane Opal and Hurricane Ivan (1997 though 2003), the average visitation to the national seashore was 4.6 million visitors. For the period since Hurricane Ivan (2004-2009), the average visitation to the national seashore was 2.4 million visitors, with visitation dramatically increasing in 2009 after the reopening of several roads and facilities. Although the national seashore is open year-round, the highest visitor use occurs from May through August (nearly 50% of annual recreation visits). June and July generally receive the

TABLE 10: ANNUAL RECREATIONAL VISITATION TO GULF ISLANDS NATIONAL SEASHORE



Source: NPS Statistics Office, 2008a

highest levels of visitation, while December and January generally have the lowest visitation. On average, the Florida District receives about 75% of the recreation visitors, although visitation fluctuates from year to year.

Based on NPS staff observations and visitor counts, the typical annual peak use days are holiday weekends, particularly Memorial Day weekend. Use patterns tend to reflect the summer vacation season and are also affected by weather patterns. The diverse attractions of the separate units tend to smooth out the seasonality. For example, auto camping at Davis Bayou and Fort Pickens remains attractive in winter, whereas beach use on the Mississippi islands declines. Use at West Ship Island is very low in the winter when the tour boat is not operating, but smaller winter declines in visitation are seen in Florida where roads provide access to all units.

In 1993 a visitor use study was conducted at the national seashore by the University of Southern Mississippi, and results were analyzed by the Hospitality and Tourism Department of Virginia Polytechnic Institute and State University. About 64% of visitors to both districts traveled less than 500 miles, and 38% traveled less than 100 miles, indicating that more than one-third of the respondents are local rather than distant travelers.

In the Florida District, nearly 70% of the respondents stayed overnight, and 34% indicated that the national seashore was their major destination. In the Mississippi District, 63% stayed overnight and 42% indicated that the national seashore was their major destination (Jurowski and Uysal 1993a, 1993b).

Table 11 presents visitation information for visitor attractions throughout the national seashore. In 2005 through 2008 the Fort Pickens and Santa Rosa Areas had limited visitation because the major roads and facilities were destroyed by recent hurricanes. With the lack of road access and other visitor facilities, the visitor opportunities transformed to a more primitive backcountry type of visitor experience at these units. Since the visitor facilities and road systems were constructed, visitation returned to pre-hurricane levels and is expected to continue to rise as the regional population increases and demands for open space and waterfront access continues to grow.

TABLE 11. ESTIMATED VISITATION AT LOCATIONS WITHIN THE GULF ISLANDS NATIONAL SEASHORE

	2002	2003	2004	2005	2006	2007	2008	2009
Florida District								
Fort Pickens	611,165	644,334	517,072	limited visitation	limited visitation	limited visitation	limited visitation	526,304
Santa Rosa Area	2,199,866	2,341,657	1,868,564	limited visitation	limited visitation	limited visitation	128,997	1,936,192
Perdido Key	436,202	569,056	506,464	398,793	454,153	458,958	393,540	259,482
Naval Live Oaks (Visitor Center)	180,676	157,759	150,144	170,032	219,483	214,828	237,926	147,925
Naval Live Oaks (Picnic Area)	33,355	37,533	28,461	26,966	34,479	30,157	34,380	27,926
Youth Group Campground Road	58,117	69,536	54,897	121,429	35,298	33,142	34,106	54,578
Okaloosa	191,037	255,782	197,960	165,349	272,995	235,770	225,143	182,013
Fort Barrancas	43,365	35,926	28,974	22,784	28,215	35,136	38,077	44,441
Boats	115,124	66,000	84,400	89,800	83,480	65,080	79,440	39,344
Bus Tour	90,338	78,880	75,072	85,016	109,742	107,414	118,963	73,962
Mississippi District								
NPS Road	750,334	817,786	858,592	713,206	760,418	871,104	807,161	846,738
Tour Boat	62,720	65,327	62,135	56,536	20,340	32,783	37,418	42,921
Private Boats	71,262	77,075	92,660	90,486	76,195	56,377	37,052	23,729
Bus Tour	3,680	3,600	2,880	2,120	1,760	960	960	1,080
Overnight Stays								
NPS Campgrounds	159,279	175,971	146,874	23,555	0	5,081	10,142	22,505
Backcountry	2,504	2,385	2,561	2,044	1,608	1,336	689	1,133

At Perdido Key, the road was also destroyed by Hurricane Ivan. Visitation quickly rebounded when road access to Johnson Beach, located at the entrance to the Perdido Key Unit, was quickly reestablished and visitor facilities were made available.

VISITOR OPPORTUNITIES

Nature, history, and recreational opportunities abound at the national seashore. Congress established Gulf Islands National Seashore in 1971 with the purposes of providing recreation for visitors and protecting the wildlife, barrier islands, fertile coastal salt marshes, dense maritime forests, historic structures, and archeological sites along the

northern shores of the Gulf of Mexico. Also protected in the national seashore are prehistoric shell mounds and fortifications dating from the 1820s up to the 1940s. Although more than 80% of the national seashore consists of submerged lands, the barrier islands, sparkling waters, and white sand beaches are the main attraction for most visitors. Common activities at the national seashore include picnicking, beachcombing, swimming, sunbathing, hiking, automobile camping, backcountry use and primitive camping, birdwatching, and sport fishing. Water-related activities include the use of powerboats, canoes, sailboats, sailboards, fishing boats, personal watercraft, and kayaks.

The units of the national seashore in Florida provide long, uninterrupted stretches of sandy beaches. However, a long history of accessibility to adjacent private lands by automobile has resulted in substantial commercial and private land development near the national seashore boundaries. However, there are still more than 40 miles of undeveloped stretches of Santa Rosa Island shoreline that offer solitude and extremely attractive, gently sloping beaches. The Florida units are accessible by car and therefore are accessible to many visitors year-round.

The Mississippi islands within the national seashore provide more than 60 miles of sandy shoreline on the Gulf of Mexico and Mississippi Sound sides. These offshore barrier islands constitute virtually all of the naturally maintained sandy shoreline on the Mississippi Coast. In addition to beach recreation potential, these barrier islands offer unique natural history interpretive opportunities. West Ship Island is the most heavily visited island within the Mississippi District of the national seashore. A tour boat takes visitors to West Ship Island from Gulfport, Mississippi, from March through October.

Because the Mississippi islands are not linked to the mainland by road, they still provide a primitive undeveloped character that is rare in public parkland located so close to intensely developed and populated areas. Horn and Petit Bois islands received national wilderness designation in 1978, protecting two of the last undisturbed barrier islands along the Atlantic Ocean and Gulf of Mexico.

Climate change may affect the visitor experience at the national seashore, ranging from altered timing of visitation to restrictions on public access. Longer, hotter summers may shift the spring and fall visitation seasons, and visitation may decline during the hottest summer months or during months with increased storms. Visitor facilities, such as campgrounds or picnic shelters, may need to be upgraded or moved to withstand severe weather, like flooding or hurricanes. Energy expenditure for cooling buildings may increase in the summer and decline in the winter. Pollen-based allergies and outbreaks of mosquito-borne diseases may also increase. Visitation for birding and fishing may change if new species from the south shift northward into the national seashore or if extant species move northward or have dramatic declines in population. Sea level rise and erosion, or the need to protect certain areas, may alter visitor access to certain parts of the national seashore such as fortifications and marsh areas.

Swimming

The most outstanding recreational resources at the national seashore are the wide, gently sloping beaches of unusually fine white sand and clear blue-green water coupled with a mild climate. Swimming and sunbathing are the most common visitor activities, and swimming is allowed at all beaches. Surfing occurs at Gulf Islands National Seashore, but not in large numbers due to the shallow beach gradient and gentle nature of the waves. Swimming in waters within 200 feet of the West Ship Island pier is prohibited, as is swimming in all waters within the Davis Bayou Area and within 200 feet of the Fort Pickens pier.

Florida District. Opal Beach at Santa Rosa, Langdon Beach at Fort Pickens, and Johnson Beach at Perdido Key provide swim beaches with lifeguards, and the Okaloosa Area facility provides opportunities for swimming. Beach

use occurs at the Naval Live Oaks Area, but at relatively low visitor use levels on both shorelines.

Mississippi District. West Ship Island serves almost the entire demand in the Mississippi District for high-density beach use and swimming because it is the only island served by tour boat. West Ship Island has a boardwalk that extends from the boat dock on the north side of the island to the south side of the island where there is a designated swim beach. Facilities that were destroyed by recent hurricanes have been reconstructed, including a bathhouse, indoor and outdoor showers, concessioner snack bar, and pavilion. Private boaters can access West Ship, East Ship, Spoil (also known as Sand), Petit Bois, and Cat islands for swimming.

Diving

Scuba diving and snorkeling opportunities exist within the marine waters of the national seashore. Several shipwreck sites near Fort Pickens, the jetties near Fort Pickens, and seagrass beds in the area north of Santa Rosa Island are popular diving areas.

Camping

Automobile camping is available year-round in Florida near Fort Pickens (a 200-site campground) and in Mississippi at Davis Bayou (a 51-site campground). In 2001 and 2002, the Florida District s received an average of 134,700 overnight stays, and the Mississippi District received an average of 36,500 overnight stays. In 2008 and 2009, after the national seashore began to recover from hurricanes and visitor access to facilities was limited, the Florida District s received an average of 9,000 overnight stays, and the Mississippi District received an average of 12,000 overnight stays. In 2010, camping was limited due to a sewer project and closures after the oil spill.

A youth group camping area is in the Naval Live Oaks Area in Florida close to the shoreline. There is also a group camping area in the Fort Pickens Area.

Florida District. In Florida, primitive camping is allowed on the east end of Perdido Key. Most campers arrive by small boat on the north side of the island. The eastern end of the island can be reached by hiking from Johnson Beach. There is no overnight backcountry camping in the Fort Pickens, Santa Rosa, and Okaloosa Areas.

Mississippi District. East Ship, Horn, Spoil, and Petit Bois islands accommodate year-round overnight backcountry camping. No camping is allowed on West Ship Island; boaters may anchor offshore, but they must be off the island and pier by sunset. There are no designated campsites on the Mississippi islands. Most camping occurs on the east and west shores of the islands where there is easy boat access to dry land, breezes to keep the insects away and good access to the south shoreline. On summer weekends, nearly all beaches on the islands are used by visitors. The most heavily used areas for camping on East Ship Island are at the west tip and along the protected north shore. On Petit Bois, the west end of the island away from the channel has heavy camping activity. The city of Ocean Springs, Mississippi, is due north from the west end of Horn Island, and therefore Horn Island has heavy visitor use. Camping is popular on the entire eastern end, along most of the north shore, and on the western end of Horn Island.

Fishing

Gulf Islands National Seashore provides visitors with a variety of fishing opportunities. About two-thirds of the national seashore consists of marine water. In addition, there are miles of beaches that have easy access for fly and surf fishing. Fly fishing generally occurs on the north side and surf fishing on the Gulf side of the barrier islands. Areas off both ends of West Ship Island and the pier are also popular fishing spots, as is the east end of East Ship Island. Fort Pickens in Florida has a fishing pier that reaches out into the bay and is

enjoyed by visitors of all ages. In Mississippi, recreational fishing is allowed in the Davis Bayou Area. The rebuilt fishing pier near the visitor center is open to the public. Spear fishing is also allowed in the national seashore. Spearing is defined as "the catching of a fish by bow hunting, gigging, spear fishing, or any device used to capture a fish by piercing its body."

All fishing regulations within the national seashore correspond to the state fishing regulations. Commercial fishing, including commercial shrimping and crabbing, are prohibited within the national seashore. The Gulf Islands National Seashore boundaries are one mile around Petit Bois, Horn, and Ship islands. The national seashore does not have jurisdiction of the marine waters around Cat Island.

Charter boat operators licensed with the National Park Service are authorized to take visitors fishing within the national seashore.

Trail Opportunities

There are extensive hiking trails throughout both districts of Gulf Islands National Seashore. Walking along the beaches of the national seashore is another popular way to explore the barrier islands.

Florida District. There are seven main trails within the Florida District. The national seashore maintains 28 miles of the 1,300 miles of the Florida National Scenic Trail that begins at Big Cypress National Preserve. At Naval Live Oaks there are three trails—the Brackenridge Nature Trail that introduces the visitor to wildlife, the first federal tree farm, animal tracks, and forest canopy; the 2.4-mile Andrew Jackson Trail that follows the historic St. Augustine-Pensacola Road; and the 2 miles of a multiuse path that accommodates cyclists, hikers, and rollerbladers. Additionally, the Discovery Trail on Perdido Key provides a boardwalk walking opportunity in that area.

Within the Fort Barrancas Unit there are two 0.5 mile trails. The first is the Trench Trail that connects Fort Barrancas to the Advanced Redoubt, and the other is the Woodland Nature Trail where visitors can stroll through a forest of sand pines (*Pinus clausa*), a tree species found only in southeastern Alabama and coastal northwest Florida.

Mississippi District. There are five trails that are part of the recreational and educational opportunities at Davis Bayou. The Davis Bayou Visitor Center Trail provides visitors with terrific views of Davis Bayou and ends at an overlook on the shore of the Mississippi Sound. The Nature's Way Trail is a short loop interpretive trail that traverses a maritime forest, an ancient dune system, and an adjacent salt marsh. Connecting the national seashore with the town of Ocean Springs, Mississippi, is the 15-mile Live Oak Bicycle Route, 2 miles of which are within the national seashore. A short CCC Trail follows on a former Civilian Conservation Corps (CCC) roadbed that leads to an overlook of the salt marsh and CCC-built features. The Davis Bayou Trail is a 1-mile trail from the visitor center to the picnic area, and this trail provides a connecting link with the Nature's Way Trail and the CCC Trail.

Wilderness Experience

In 1978 Congress designated Horn and Petit Bois islands as wilderness areas, protecting two of the last undisturbed barrier islands along the Atlantic Ocean and Gulf of Mexico. The Wilderness Act provides that designated wilderness areas must have primeval character without permanent habitation or improvements; be primarily influenced by the forces of nature; have outstanding opportunities for unconfined types of recreation; and contain features of scenic, ecological, scientific, educational, or historical value. These two islands provide visitors with the opportunity to experience the undisturbed and wild characteristics of a barrier island. The wilderness islands provide visitors with some of the most primitive opportunities available at the national seashore. The natural sounds of the barrier island environment are a prime component of the experience. A carnival

beach atmosphere, including restaurants, casinos, and organized beach activities, can be experienced along the nearby Gulf Coast, but opportunities for wilderness experiences exist only at Horn and Petit Bois islands. Horn and Petit Bois islands are accessible by boat (landing below the high water line, the boundary of the designated wilderness) for day and overnight use.

Shoreline Use

Most visitor use occurs along the shorelines of the barrier islands. The land/water interface offers outstanding opportunities for exploring the unique natural, cultural, and recreational resources of the national seashore. All shorelines are open to use, including for boat landing, except during designated closures. Shoreline use includes swimming, fishing, picnicking, boating, walking, beachcombing, wildlife viewing, and bird-watching.

General Watercraft Use (Motorboats, Canoes, and Kayaks)

Watercraft have been used in Gulf Islands National Seashore since it was established in 1971. Although boating is not mentioned in the national seashore's enabling legislation, it is recognized as a mode of access for many visitors. Boating use occurs in all marine waters of the national seashore, although the north sides of the barrier islands have more use than the south sides. Except for designated closures, boats are permitted to land on all national seashore shores. The operation of personal watercraft (PWC) is allowed at Gulf Islands National Seashore with restrictions as described below by district.

Florida District. In this district of the national seashore there is a boat launch at the Okaloosa Area and a boat launch for small vessels at the Perdido Key Unit. Perdido Key has the most concentrated boating use. Recreational fishing boats are common along the Gulf shore of Santa Rosa Island. Many boats cross through national seashore waters in Florida to access Pensacola Bay and the area north of Santa Rosa Island. Non-motorized boat activity includes canoes, sea kayaks, sailboats, and sailboards. Escambia County is proposing a canoe trail that crosses marine waters within the national seashore. In the summer, sailboats often sail out to the barrier islands, anchor off the north sides, and stay for the weekend.

The final rule for personal watercraft allows personal watercraft use in all park waters are open to other motorized watercraft, but establishes a flat wake zone within 300 yards from park shorelines. The lagoons of Perdido Key within Big Lagoon are closed to all motorized watercraft. Areas within 200 feet of the remnants of the old fishing pier and within 200 feet of the new fishing pier at Fort Pickens are closed to all private boating activities. Personal watercraft operation is also prohibited within 200 feet of non-motorized vessels and people in the water, except individuals associated with the use of the personal watercraft.

Mississippi District. The national seashore has a small boat launch at Davis Bayou. The most concentrated boating use within the Mississippi District is near the east and west tips of the barrier islands, around the West Ship Island pier, and along the entire north shore of Spoil Island.

Hundreds of recreational vessels typically congregate on spring and summer weekends along the shoreline tips of Horn Island, with lesser concentrations spread along the north shorelines of Horn and Petit Bois. The sound associated with these gatherings along the periphery of the designated wilderness may challenge the ability of wilderness users to find the solitude and natural quiet that they seek.

The final rule for personal watercraft allows personal watercraft use in all park waters which are open to other motorized watercraft, but establishes a flat wake zone within 300 yards from park shorelines. However, around the wilderness islands of Horn and Petit Bois the flat wake zone extends a half mile from the

shoreline. Around West Ship Island an expanded flat wake zone also exists for half mile from either side of the pier and extends half mile from the shoreline.

Wildlife-Watching

The national seashore comprises several diverse ecological communities that attract a wide variety of bird life. The offshore barrier islands consist of open beaches, dunes, freshwater marshes, and wooded areas. On the mainland, also, are freshwater marshes, salt marshes, and wooded areas that offer wildlife habitats. More than 280 species of birds have been identified within the boundaries of Gulf Islands National Seashore since its establishment in January 1971. Bird-watching and watching of other wildlife in the national seashore continues to grow in popularity. Gulf Islands National Seashore has sites listed on the Great Florida Birding Trail and the Mississippi Coastal Birding Trail.

Picnicking

Formal picnicking opportunities are available at the Okaloosa day use area, Opal Beach, Fort Pickens, Naval Live Oaks, Johnson Beach, Davis Bayou, and West Ship Island. Picnicking without facilities is common along beaches in all units of the national seashore.

Bicycling

Florida District. Fort Pickens Road provides a 14-mile round-trip bicycling opportunity. At Naval Live Oaks, the national seashore maintains a 2.5-mile section of the 40-mile bike route that is adjacent to U. S. Highway 98. Visitors can cycle on a paved road from the entrance gate to the end of the Johnson Beach Road. Also, there is a bike lane along J. Earle Bowden Way that provides cycling opportunities for visitors in the Santa Rosa Area.

Mississippi District. The Mississippi District's 15.5-mile round-trip Live Oak Bicycle Route connects the Davis Bayou Area of the national seashore to the town of Ocean Springs, Mississippi, at the Old Louisville and Nashville Train Depot.

Exploring History

The defense fortifications and other historic features play a highly visible and important role in the overall visitor enjoyment and national significance of Gulf Islands National Seashore. The forts of Gulf Islands National Seashore span more than 200 years, from the Spanish colonial Bateria De San Antonio (1797) to the World War II-era Battery 234. This reflects the historic value of the anchorages at Pensacola Bay, Florida, and Ship Island, Mississippi. Most striking among these are the American Third System forts—Fort Pickens, Fort Massachusetts, Fort Barrancas, Fort McRee, and the Advanced Redoubt, all of which saw action during the Civil War. The marine waters of the national seashore also contain many shipwrecks, some dating back to the early Spanish exploration.

Relating to military history, the Naval Live Oaks Reservation is all that remains of a reservation set aside in 1828 by President John Quincy Adams for conserving live oaks, which were extensively used for ship-building. Today, visitors are provided the opportunity to hike and picnic within Naval Live Oaks Area.

Visitors have access to five visitor centers/information stations to learn about the historic and natural resources and recreational opportunities available at Gulf Islands National Seashore. These visitor centers/information stations are located at Naval Live Oaks, Fort Pickens, and Fort Barrancas, Davis Bayou, and Fort Massachusetts.

SOCIAL AND ECONOMIC ENVIRONMENT TOPICS ANALYZED IN DETAIL

This section details the social and economic baseline describing the demographic, economic, and governmental trends in the communities adjacent to Gulf Islands National Seashore.

Five counties are adjacent to the national seashore—Escambia, Santa Rosa, and Okaloosa counties in Florida; and Jackson and Harrison counties in Mississippi. The economies of the nearby areas are very diverse, although tourism is a major activity — as demonstrated by the number of tourism-related businesses that make up the retail trade sector of the economy. For all counties except Jackson County, Mississippi, and Okaloosa County, Florida, retail trade is the largest sector of the economy, followed by manufacturing and wholesale trade. Retail trade is also the largest sector of the economy in Okaloosa County, but wholesale trade is the second largest sector of the economy in this county and manufacturing is the third largest. In Jackson County, manufacturing is the largest sector, followed by retail trade and wholesale trade (Census Bureau 2002).

FLORIDA DISTRICT AREA OF INFLUENCE

Most of the Florida units of the national seashore are within the Pensacola Metropolitan Statistical Area and include Escambia and Santa Rosa counties. A study by the University of Florida (Livingston and Arthur 2002) reports that the combination of miles of unspoiled white sand beaches, state and national parks, and a historic district with some of the nation's oldest buildings gives the Pensacola area a strong tourist appeal.

The (Livingston and Arthur) study notes that the estimated 2007 population within the metropolitan statistical area is 453,451.

TABLE 12: POPULATION TRENDS FOR ESCAMBIA AND SANTA ROSA COUNTIES

Year	Escambia	Santa Rosa
2000	294,410	117,743
2003	301,040	132,549
2006	305,287	144,279
2009	303,343	151,759

Source: U.S. Census Bureau

The study further reported that there are about 157,070 households and a mean household income of $66,426; the average annual employment is 220,990 persons. The largest industry sector is the services sector, which employs 73,340 persons, followed by retail trade (41,850 persons), military and Department of Defense civilians (23,446 persons), state and local government (21,710 persons), and construction (16,110 persons). The study found that tourism provides a strong engine for growth of retail and service-based businesses within the Pensacola region and that tourism is a direct result of the quality and amount of seashore beaches. The region has seen a strong growth in personal, business, and professional services and in retail trade during the past two decades. Growth in each of these sectors is influenced by growth in the visitor industry.

Pensacola economy remains dependent upon the military and defense industry spending. The military presence in the region around the national seashore includes Pensacola Naval Air Station, Eglin Air Force Base, Naval Technical Training Center, Corry Station Naval Technical Training Center, and Naval Air Station Whiting Field. Military activity in the Pensacola area has long been a major source of (1) employment for local residents, (2) sales for local companies, and (3) tax revenues for local government. It is estimated that the military is now generating about $1,369 million in total industry output (the value of an industry's total production) per year in the Pensacola area and is responsible for employing more than 13,000 persons. Military personnel earn approximately $1,240

million in payroll in a calendar year (Pooley 2007).

The Pensacola area has a vibrant tourism industry that contributes to the growth and economic development of the area. Tourism is responsible for $876.6 million in total industry output per year, employing more than 19,000 persons who earn about $288.5 million in wages, and producing $425.2 million in additional economic benefit (Pooley 2007).

MISSISSIPPI DISTRICT AREA OF INFLUENCE

Overview

Jackson and Harrison counties are the primary areas whose population has a direct influence on the Mississippi District of Gulf Islands National Seashore. Mississippi's coastal recreation and tourism industry is a major portion of the entire state's recreation and tourism industry. Coastal tourism accounts for about one-third of the total state tourism expenditures. The industry consists of typical coastal tourism development activities, as well as a large charter boat and recreational boating fleet (MSU–CREC 2008).

According to the Mississippi State University Coastal Research and Extension Center, the recreational fishing industry has a significant economic impact on the coastal economy in Mississippi. About 74% of the anglers fishing in Mississippi come from within the state. The growth in recreational fishing participation is expected to increase by 18.5% by the year 2025 in Mississippi. Recent surveys show that Mississippi anglers annually spend more than $50 million on food and beverages, more than $9 million on lodging, more than $19 million on bait and ice, more than $15 million on boat fuel, and more than $57 million on fishing tackle. About 10% of the $236 million spent annually by Mississippi anglers is spent in the three coastal counties. The Mississippi recreational fishery also receives federal funds in the form of sport fish restoration apportionments (which are generated by taxes on fishing-related purchases). Mississippi receives more than $2 million a year or about $5.24 per license holder. These monies are used to build access infrastructure such as boat ramps and fishing piers, develop artificial reefs, and conduct boating safety programs.

Mississippi had 30 state-licensed casinos as of June 2010. The gross gaming revenues in fiscal year (FY) 2009 were $2.58 billion. This tourist/visitor portion comprised 32% of the $5.6 billion statewide travel and tourism expenditures. Mississippi's total gaming-related tax revenues were $312.1 million in FY 2009, with $208.4 million in state tax receipts and $103.7 million earmarked for cities/counties (MDA 2010).

Jackson County, Mississippi

Jackson County is primarily urban in character and has a large manufacturing base. Pascagoula is the largest city in the area, with Moss Point, Ocean Springs, and Gautier being the other incorporated areas. The major outdoor recreational opportunities in the Jackson County area include Gulf Islands National Seashore, Shepard State Park, the Sandhill Crane Wildlife Refuge, and the Pascagoula River Game Management Area.

As shown in the table below, the 2009 estimated population of Jackson County is 132,922 people. The population dropped after the 2004-2005 hurricanes, but returned to pre-hurricane levels within a few years.

TABLE 13: POPULATION TRENDS OF JACKSON COUNTY

Year	Jackson County
2000	131,420
2003	132,826
2006	128,190
2009	132,922

Source: U.S. Census Bureau

The largest employment sectors are manufacturing with an average employment of 18,050, followed by industries that contribute to tourism—wholesale/retail (9,898), services (8,760), government (9,790), and construction (4,548). The 2000 U.S. Census reports that the

average per capita personal income was $22,292, 74% of the population was white, 21% was black, the median age was 35 years, and 16% of the population had a college degree.

Casino gaming has altered the appearance of the coastline dramatically since the 1980s. This is particularly true in Biloxi, where multistory parking garages and hotels now stand where shrimp boat docks and seafood factories once existed. Some coast residents feel that the new facilities are a vast improvement over what was considered a dilapidated section of waterfront. Others feel that the neon, lasers, and glitz have erased the city's true character. Many waterfront-dependent industries have been displaced by dockside gaming development. Zoning changes instituted to accommodate and encourage casinos have resulted in increased land values for what was once commercial and light industrial waterfront property. One of the hardest hit industries was the commercial fishing fleet in Biloxi. Support structures for fishing operations like ice and fuel docks as well as unloading and berthing facilities were either lost outright or moved to less accessible locations.

Harrison County, Mississippi

Harrison County is in the center of the three counties adjacent to the Gulf of Mexico in Mississippi. The county is the urban center for economic and social activities in the southern portion of the state. The cities of Biloxi and Gulfport comprise more than 50% of the county's population. As shown in the table below, the 2009 estimated population of Harrison County is 181,191 people. The population dropped after the 2004-2005 hurricanes, and has been slow to return to pre-hurricane levels. The population is expected to grow slowly into the future.

TABLE 14: POPULATION TRENDS OF HARRISON COUNTY

Year	Harrison County
2000	189,601
2003	191,012
2006	171,890
2009	181,191

Source: U.S. Census Bureau

The largest employment sectors are services (employing 33,644) and wholesale/retail trade (employing 21,842), both which are strengthened by the area's growing tourism industry. The introduction of the casino gaming Industry in 1992 has added substantially to an active tourism market along the Gulf Coast. Government is the third largest employment sector. Military installations are a large portion of government activity in the area. Keesler Air Force Base in Biloxi employs 16,000 people and generates contracts and a payroll worth $673 million annually. The Naval Construction Battalion Center in Gulfport employs 4,562 military and civilian workers and generates $108 million in annual payroll. The port of Gulfport is growing in importance as a hub for international trade. The 2000 U.S. Census reports that the average per capita personal income was $24,157, 72% of the population was white, 21% was black, the median age was 34 years, and 18% of the population had a college degree.

URBAN GROWTH AT THE BOUNDARIES OF THE NATIONAL SEASHORE

The population centers in the northern Gulf of Mexico are concentrated along the coast. Inland lands in the region are more rural, with much of the area made up of marsh and open water. Cities and towns in the area include Destin, Fort Walton Beach, Gulf Breeze, Pensacola, and Pensacola Beach, Florida; Gulf Shores, Alabama; and Pascagoula, Ocean Springs, Biloxi, and Gulfport, Mississippi. The table below shows units of the national seashore that are directly adjacent to large urban populations.

TABLE 15: URBAN COMMUNITIES ADJACENT TO GULF ISLAND NATIONAL SEASHORE UNITS

Adjacent Communities	National Seashore Units
Ocean Springs, MS	Davis Bayou
Perdido Key area of Pensacola, FL	Perdido Key
Pensacola, FL	Naval Air Station Historic Sites
Gulf Breeze, FL	Naval Live Oaks
Pensacola Beach, FL	Fort Pickens
Pensacola Beach and Navarre, FL	Santa Rosa
Fort Walton Beach, FL	Okaloosa

Many of these communities have high density housing and businesses along the border of the national seashore. This urban development at the border of national seashore lands can have positive and negative influences on the visitor experience and the protection of the natural and cultural resources of the national seashore. The urban/wild interface can also provide many local residents with easy recreational access, scenic views, and economic benefits.

GULF ISLANDS NATIONAL SEASHORE'S IMPACT ON LOCAL AND REGIONAL ECONOMY

Gulf Islands National Seashore is an economic generator that helps anchor the economy of the gateway communities while contributing to the regional economy. There are numerous ways that the operations and management of Gulf Islands National Seashore contribute to the economy. This section describes the national seashore's contribution through expenditures from seashore visitors, NPS expenditures, and NPS employee salaries.

Each year millions of local and nonlocal visitors are attracted to Gulf Islands National Seashore. In 2009 the annual visitation to the national seashore was 4.13 million recreation visits. These local, regional, national and international visitors contribute to the local economy by spending money on meals, lodging, fuel, transportation, recreational equipment, and other tourist-related expenditures. These visitor expenditures filter through the economy in addition to contributing directly to the local tax base, e.g., sales tax.

Expenditures of National Seashore Visitors

The following analysis uses an economic impact framework to quantify the direct and indirect expenditures by national seashore visitors using data from 2003. The data from 2003 were chosen because they represent a pre-hurricane baseline. Data from 2004 and 2005 would be skewed by the impacts of the five hurricanes that impacted the national seashore during that time period, and visitation was severely reduced in the several years following because of road and facility closures. Though 2009 visitation rebounded to near pre-hurricane levels, the impact of these visitors on the local economy is unknown. National seashore visitation in 2003 better reflects the potential future visitation in the coming years, though the Deepwater Horizon oil spill that occurred in April 2010 is expected to reduce visitation and cause other impacts on the local and regional economy.

Economic impacts of visitor spending are estimated using the Money Generation Model (MGM2) using multipliers for local areas around the national seashore. Multipliers capture both the direct and secondary economic effects in gateway communities around the national seashore in terms of jobs, personal income, and value added.

In this analysis, visitor spending only covers economic effects on the local area around the national seashore. The economic modeling does not include impacts of the NPS operations/employees, construction activity, or visitor spending outside the local area.

In 2003 there were 4.94 million recreation visits to the national seashore. It is estimated that 60% of those recreation visits were local residents on day trips; 30% were visitors on day trips from outside the local area; 5% were visitors on overnight trips staying in lodges,

motels, hotels or bed-and-breakfasts in the area; and 5% were camping. On average, visitors spent $69 per party per day in the local area. Total visitor spending was $57.20 million dollars in 2003.

The direct effect of this spending covers sales, income and jobs in businesses selling goods and services directly to national seashore visitors. The direct effects of the $57.20 million spent by national seashore visitors were $44.57 million in sales, $16.50 million in personal income (wages and salaries), $ 24.86 million in value added, and 1,132 jobs. The largest direct effects were $8.21 million in the hotel sector, $13.81 million in food and drinking places, $7.84 million in amusements, and $8.60 million in retail trade. As visitor spending circulates through the local economy, secondary effects created an additional $7.07 million in personal income and 274 jobs. In sum, visitors to Gulf Islands National Seashore spent $57.20 million dollars in 2003, which supported a total of $64.10 million in sales, $23.57 million in personal income, 1,407 jobs, and $37.08 million in value added.

Expenditures of the National Seashore

Money from Gulf Islands National Seashore's operation/maintenance budget and capital improvements to resources and infrastructure of the national seashore comes into gateway communities through the federal appropriations process. A large share of the national seashore's budget provides an annual and stable economic benefit to the local and regional economy. As with visitor expenditures described above, local NPS expenditures have direct and secondary economic benefits. Table 16 displays the national seashore's annual operations and maintenance expenditures for the fiscal years 2000 through 2006. Table 17 shows nonsalary national seashore expenditures in local states.

TABLE 16: NATIONAL SEASHORE OPERATIONS BUDGET

Year	Budget
2000	$4,866,000
2001	$5,660,000
2002	$5,966,000
2003	$5,965,000
2004	$5,939,000
2005	$6,105,000
2006	$6,272,000

TABLE 17: NATIONAL SEASHORE NONSALARY CONTRIBUTIONS TO THE REGIONAL ECONOMY BY STATE

Year	AL	FL	LA	MS
2000	108,000	412,000	10,000	109,000
2001	106,000	535,000	0	362,000
2002	26,000	161,000	0	96,000
2003	261,000	90,000	79,000	137,000
2004	Data	Not	Available	
2005	22,981	46,800	0	0
2006	312,000	498,000	204,000	0

National Seashore Employee Salaries

Personal expenditures (paying salaries) are the major portion of the national seashore's operations/maintenance expenditures. These expenditures have the most direct impact on local and regional communities because NPS employees spend a majority of their earnings for living, recreation, education, local taxes, and other daily expenses; these expenses support local businesses and institutions. And once spent, the money can circulate throughout the economy. The data in the table below displays the combined salaries of employees by county. The data is based on the financial plan for FY2008 and not actual dollars in order to capture the gross amounts. Figures do not include employees who live out of the area.

TABLE 18: COMBINED NPS SALARIES BY COUNTY, FY 2008

Country	Salaries
Escambia County, FL	$ 1,932,687
Santa Rosa County, FL	$ 2,125,574
Okaloosa County, FL	$ 9,908
Jackson County, MS	$ 1,000,363
Harrison County, MS	$ 163,136
Stone County, MS	$ 103,608
Lowndes County, GA	$ 71,009

NPS OPERATIONS TOPICS ANALYZED IN DETAIL

MANAGEMENT DIVISIONS

Superintendent's Office and Administration Division

The staff of the Superintendent's Office and Administration Division work to guide the efforts to protect resources and create a safe and enjoyable experience at the national seashore. The Superintendent's Office and the Administration Division encompass all national seashore management and administrative support activities. In fiscal year 2010, the Superintendent's Office and Administration Division operated with 10 full-time-equivalent (FTE) employees. The Superintendent's Office and Administration Division include responsibilities relating to national seashore management, financial management, human resources, and information technology management.

The Superintendent's Office and Administration Division staff directs all national seashore communications and external affairs activities, planning, human resource management, information technology, leadership, and financial management.

The financial management team coordinates the financial resources required to achieve the national seashore's mission, directs preparation for budget development, and helps find resolution among divisions competing for limited resources.

The human resources team develops and directs staff support activities, and the information technology team handles the communications functions. Gulf Islands National Seashore maintains a communications system that allows staff spread across two states and multiple remote island locations to communicate with each other, with NPS regional and national offices, and with emergency service personnel.

Civic engagement and planning are a growing role all managers at the national seashore. Overall NPS operations must create innovative partnerships and develop excellent relationships with stakeholders and local constituents to help preserve the natural and cultural resources and visitor opportunities at the national seashore. The NPS staff work to partner with cooperating associations, area universities and nonprofits, other government agencies, and friends groups to engage the community in national seashore programs and stewardship.

Senior management staff are spending more of their time on coordinated planning efforts. The demand for planning at the national seashore continues to evolve due to increased urbanization along NPS boundaries, threats and impacts from hurricanes, increase demand for visitor access and opportunities, changing technology in regards to recreational equipment, and greater threats to the natural and cultural resources that the national seashore is mandated to preserve and protect.

Interpretive Division

Millions of visitors descend on the national seashore each year to relax on its pristine beaches, tour its forts, hike its woods and wetlands, and camp in its campgrounds and wilderness areas. Providing visitors with opportunities to enjoy interpretive and educational programs about the national seashore's natural and cultural resources are responsibilities of the Interpretive Division staff. This division's functional area covers a wide range of activities, including, interpretive and educational programs, visitor center management, interpretive media, and concessions management. In fiscal year 2010, the Interpretive Division operated with 10 full-time-equivalent employees.

Interpretive activities at the national seashore include tours, talks, guided walks, ranger-led

special programs, special events, and outreach activities. During the last five years, increasing costs and stagnant operating budgets have forced the national seashore to significantly curtail interpretive programs. At the same time, the national seashore has seen its high visitor season lengthen, increasing the demand for year-round programs However, the national seashore will not be able to increase the frequency of fort tours or expand popular and overcrowded programs such as guided snorkeling, candlelight tours of Fort Pickens, and boat tours at Davis Bayou because current staffing levels are inadequate.

Educational services provided by the national seashore include ranger-led and self-directed educational tours, the Junior Ranger, Sea Star programs, and the Junior Explorer programs. The demand for ranger-led educational programs is greater than current seashore resources can accommodate. The national seashore regularly turns away school groups that are interested in curriculum-based programs.

Resource and Visitor Protection Division

The focus of the Resource and Visitor Protection Division is primarily to protect the cultural and natural resources of the national seashore; to protect visitors and their experience from hazardous conditions and illegal or inappropriate behaviors; to come to the aid of distressed visitors by any cause; to provide for recreational camping opportunities; and to raise revenues in support of critical park operations. The staff of this division includes the law enforcement arm that enforces the rules and regulations. In fiscal year 2010, the Resource and Visitor Protection Division operated with 31 full-time-equivalent employees. This division is also tasked with providing for visitor safety. Law enforcement rangers patrol the national seashore by automobile, all-terrain vehicles, foot, and boat to provide a safe experience for visitors and employees. Rangers also oversee lifeguard operations at three beaches, conduct search-and-rescue operations, provide emergency medical services, assist with suppressing wildland and structural fires, conduct special law enforcement operations, respond to natural disasters, and assist local jurisdictions in emergency response situations. The lifeguard program provides Junior Lifeguard camps in both districts.

The Division's staff also provide visitor information and collects fees at three entrance stations and manages the campgrounds at Davis Bayou, Fort Pickens, and the Naval Live Oaks Group Camp. Most of the recreational fees collected at these sites are used to fund the fee operation as well as special projects, like those that preserve and rehabilitate the park's vast array of historic facilities.

Science and Resources Management Division

The staff of the Science and Resources Management Division is directly involved in the preservation, management, and research of the natural and cultural resources of the national seashore. Activities include research, restoration efforts, species-specific management programs, wild land fire management, archives and collections management, historic site protection, and information integration activities. In fiscal year 2010, the science and resources management division operated with 9 full-time-equivalent employees.

One of the responsibilities for this division is implementing the natural resource management program. This program works to preserve the threatened and endangered species and the integrity of the natural resources. The staff continue to survey plant and animal species through direct inspection, as well as through analysis of environmental data. These tasks have become increasingly important with the steady increase of visitation, as well as the rapid development of the areas surrounding both the Florida and Mississippi districts. The human impact must be carefully assessed and controlled, requiring dedicated resources from both resource management and law enforcement staffs. In addition, invasive species are actively monitored and managed. The threat from these species continues to

increase with the region's development, further taxing the program's available resources. Additional biological technicians are needed to more thoroughly catalogue and monitor existing habitats. For example, the seagrass beds, which can be seen as an indicator of the local environmental conditions, are being damaged, and current staffing levels cannot mitigate this damage. In addition, a greater law enforcement presence is necessary to discourage abuse of the resources, particularly in wilderness areas such as the barrier islands of the Mississippi District.

Gulf Islands National Seashore boasts a national historic landmark (Fort Barrancas, located within the Pensacola Naval Air Station boundary), 57 properties on the National Register of Historic Places (and four eligible properties), 62 buildings on the List of Classified Structures, and a museum collection of more than 190,000 items. The cultural resource management program is entrusted with the preservation of these resources, including preventing their deterioration, destruction, loss, and theft. The division staff are constantly surveying the historic buildings and monitoring their structural integrity, and implementing ongoing and emergency repair/rehabilitation projects.

Most prominent among the list of resources are the 18th and 19th century fortifications located across two districts: Fort Pickens, Bateria de San Antonio, Fort Barrancas, and the Advanced Redoubt are in the Florida District, and the Mississippi District is home to Fort Massachusetts. The forts have a long and interesting history— Geronimo was imprisoned at Fort Pickens, and Fort Barrancas was home to the 13th Coast Artillery Regiment, charged with the defense of Pensacola Bay until World War II. The attention these structures require is intense and continuous, made more so by harsh weather and the continuous visitor use. Each of the forts, to different degrees, shows the strain of age, environment, and visitor traffic. Fortification and historic buildings of Fort Pickens have decayed beyond repair and have been subsequently closed to the public. Fort Massachusetts is under constant threat of being swallowed by the Gulf of Mexico.

The science and resource management division works to cultivates science-related projects to learn about and support the preservation of natural and cultural resources of the national seashore. This vital work is supported by developing stewardship programs and relationships with a variety of partners, including investigators from a university to explore and understand the issues and threats.

Facility Management Division

The staff of the Facility Management Division is responsible for all activities required to manage, operate, and maintain the national seashore's infrastructure on a daily basis. Buildings, roads, trails, utilities, and campgrounds require a range of operational activities from basic sanitation and janitorial services to mowing lawns and testing water quality. Facility management includes activities directed to operating, caring for, and maintaining national seashore assets and infrastructure such as grounds, buildings, roads, trails, utilities, fleet vehicles, and equipment. In fiscal year 2010, the Facility Management Division operated with 26 full-time-equivalent employees.

The janitorial operations for the national seashore include the cleaning and sanitation of 21 comfort stations, 7 administrative buildings, and 7 visitor use structures. The roads operations program includes services that ensure the safe and effective use of all roadways for national seashore visitors and staff. The Florida District's more than 3.9 million annual visitors travel over 19.82 miles of paved and 1.72 miles of unpaved roads, largely by personal vehicles. Most major work is performed under the Federal Lands Highway Program, but the national seashore is responsible for routine patching of paved roads and grading of unpaved roads. The greatest challenge, however, is keeping the roads free of sand. The regions' frequent storms deposit sand on the roads in drifts that

are sometimes feet deep. Because roads must be clear at all times, maintenance staff are pulled from other duties to remove the deposits.

In the Mississippi District, the road inventory consists of 3.38 miles of paved roads, 11.37 miles of unpaved roads, 5,556 linear feet of guard rails, and 3 vehicle bridges. Sand removal is rarely an issue, but roadside vegetation control is of a higher priority than in the Florida District. With one minor exception, the Mississippi District's entire road inventory is in the Davis Bayou Area. Consistent with bayou ecology, vegetation grows quickly and densely, choking road shoulders and obscuring road signs.

The trail program includes those functions associated with the routine maintenance of boardwalks and unpaved visitor use trails throughout the national seashore. The Mississippi District's trail system consists of 3,768 linear feet of boardwalk and 26,615 linear feet of unpaved trails. In Florida, the trail system totals 141,623 linear feet of unpaved trail, 36,960 linear feet of paved trails and 5,943 linear feet of boardwalks. Boardwalks are the most heavily used component and thus receive regular attention. Their condition is frequently assessed, and boards, railings, and hardware are replaced as needed. This is an ongoing and resource-intensive process. In addition, the region's frequent storms wreak havoc on the system and often necessitate wholesale replacement or rebuilds.

The transportation systems and fleet program staff are responsible for the maintenance of and cyclic repair/rehabilitation on vehicles to prolong their useful life. In Mississippi, this program is the lifeblood of an operation largely removed from major roads and broken up by miles of open water between five islands. NPS watercraft are vital for the operations and management of the barrier islands.

OTHER NPS OPERATIONS

The administrative headquarters for the Florida District is at Naval Live Oaks. The size of the facilities does not effectively accommodate the staffing and space/program needs. In the Mississippi District the administrative headquarters at Davis Bayou does provide for efficient and effective space for the program needs of the Mississippi operations.

The facility management and maintenance buildings, utilities, and storage areas are dispersed throughout the national seashore. Primary facilities are at Naval Live Oaks, Fort Pickens, and Davis Bayou. Smaller facilities are scattered at national seashore sites on Santa Rosa and West Ship islands and at Perdido Key. A small ranger station is on Horn Island. There are no permanent NPS facilities on Cat Island.

At Davis Bayou there is a large pier and warehouse on the waterfront to support national seashore operations to and on the barrier islands in the Mississippi District. Smaller piers that support island access and opportunities are at Horn Island, West Ship Island, and Fort Pickens.

The national seashore does not provide any public land shuttle services. Public water access to the barrier islands are limited to seasonal passenger ferry services between Gulfport, Mississippi, and West Ship Island.

IMPACT TOPICS CONSIDERED BUT DISMISSED

CULTURAL RESOURCES

Archeological Resources (Terrestrial and Marine)

Numerous terrestrial cultural resource surveys have been conducted in Gulf Islands National Seashore by NPS personnel and by other public and private institutions. These surveys have identified archeological sites throughout the national seashore that are associated with both the historic and prehistoric periods. Archeological sites within the national seashore include both prehistoric and historic period sites. Prehistoric sites (primarily Mississippian sites) are generally midden sites containing a variety of ceramic and lithic materials. Additionally, ecofacts such as marine shells can be found that are a result of resource harvesting. (Ecofacts are things from living organisms that have not been modified by humans.) Historic sites have been identified in the national seashore as well. Archeological remains are primarily midden sites with identified materials ranging from glass and ceramic to metal, and in some cases the remains of wood used in construction, fires, and tools.

No systematic studies have been conducted to identify archeological sites in the marine environment. Some remote sensing studies have been conducted in connection with placement of pipelines and communication cables within the national seashore, but only very limited verification of the nature of the anomalies identified has occurred.

Before any ground-disturbing activities, an archeological evaluation is undertaken to ensure that no resources on or eligible for inclusion on the National Register of Historic Places (National Register) are lost or damaged due to NPS activities. As appropriate, archeological surveys and/or monitoring would precede any construction. Known archeological resources would be avoided to the greatest extent possible. If archeological resources that are listed on or eligible for listing on the National Register could not be avoided, a mitigation strategy would be developed with the appropriate Mississippi or Florida state historic preservation officer and any associated Native American tribal representatives.

Archeological sites continually deteriorate, due primarily to the effects of weather and gravity. Left alone, sites will inevitably degrade over time. However, impacts from human visitation and use contribute to the effects of natural agents of deterioration, and can substantially increase the rate of site deterioration. Archeological resources accessible from visitor use areas or trails would be vulnerable to inadvertent damage and vandalism. Inadvertent impacts would include picking up or otherwise displacing middens and other material, the compaction of cultural deposits, and the creation of non-designated visitor-created trails (which can lead to erosion and destabilization of the original site architecture). Intentional vandalism includes removing artifacts and probing or digging in sites. Inadvertent damage or vandalism would result in a loss of surface archeological materials, alteration of artifact distribution, and a reduction of contextual evidence. Such adverse impacts would be mitigated through additional stabilization of the site, the elimination of nondesignated visitor-created trails to disturbed or vulnerable sites, and/or systematically collecting surface artifacts for long-term curation. Continued ranger patrol and emphasis on visitor education, regarding the significance and fragility of such resources and how visitors can reduce their impacts to archeological resources, would discourage vandalism and inadvertent impacts and minimize adverse impacts. Adverse impacts associated with visitor use under each alternative would be negligible to minor and permanent.

During construction, if previously undiscovered archeological resource were uncovered, all work in the immediate vicinity of the discovery would be halted until the resources could be identified and documented and an appropriate mitigation strategy could be developed with the appropriate Mississippi or Florida State historic preservation officer and appropriate representatives of Native American tribes traditionally associated with the areas of the national seashore.

Because archeological surveys or monitoring, as appropriate, would precede all ground-disturbing activities and archeological resources would be avoided to the greatest extent possible during construction, any adverse impacts to archeological resources associated with visitor use would be negligible to minor and the same for all alternatives, archeological resources was dismissed as an impact topic.

Cultural Landscapes

According to the National Park Service's *Cultural Resource Management Guideline* (DO-28), a cultural landscape is a reflection of human adaptation and use of natural resources and is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built. The character of a cultural landscape is defined both by physical materials, such as roads, buildings, walls, and vegetation, and by use reflecting cultural values and traditions.

Natural features such as landforms, soils, and vegetation are not only part of the cultural landscape—they provide the framework within which it evolves. In the broadest sense, a cultural landscape is a reflection of human adaptation and use of natural resources and is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built.

Identifying the important characteristics and features in a landscape and understanding them in relation to each other and to important historic events, trends, and persons allows examination of the landscape as a cultural resource. In many cases, these features are dynamic and change over time. In many cases, historical significance may be ascribed to more than one period in a landscape's physical and cultural evolution.

According to federal law and NPS *Management Policies 2006*, all cultural landscapes are to be managed as cultural resources, regardless of the type or level of significance. Cultural landscape management focuses on preserving a landscape's physical attributes, biotic systems, and use when that use contributes to its historical significance.

Six potential cultural landscapes have been identified and registered in the NPS Cultural Landscape Inventory database. Cultural Landscape Inventories have not yet been completed for these areas, nor have they been evaluated for their significance or their eligibility to the National Register of Historic Places. The six are

In the Florida Unit:

- Fort Barrancas
- Fort Pickens
- Naval Live Oak Reservation
- Pensacola Lighthouse Station

In the Mississippi Unit:

- Davis Bayou Area
- Fort Massachusetts

Other potential cultural landscapes in the national seashore may be identified in the future. In the interim, the proposed actions in alternatives B, C, and D would have negligible to minor impacts on these cultural landscapes. Using sensitive design and installation/construction of wayside exhibits, kiosks, interpretive signs, and new structures, the National Park Service will avoid impacting the character-defining and circulation features of these landscapes. If the Pensacola Lighthouse were to come

under NPS management, no changes to the cultural landscape would be expected.

Through sensitive design and installation/ construction of features inside or near cultural landscapes, impacts to cultural landscapes would be negligible to minor. Therefore, this topic has been dismissed for further analysis. The park will complete the Cultural Landscape Inventories listed above, and based on the information gathered during that process, they will also nominate eligible cultural landscapes to the National Register of Historic Places.

Ethnographic Resources

Ethnographic resources are defined by the National Park Service as any "objects and places, including sites, structures, landscapes, and natural resources, with traditional cultural meaning and value to associated peoples. Research and consultation with associated people identifies and explains the places and things they find culturally meaningful" (NPS *Management Policies 2006*).

Native Americans from numerous tribes have long been associated with the areas of western Florida and southeastern Mississippi. During scoping for this general management plan, government-to-government consultations were undertaken with the Native American tribes traditionally associated with the area now encompassed by the national seashore: (See Chapter 5: Consultation and Coordination for a complete list). Tribal representatives did not identify within the national seashore any places or resources closely linked with their own sense of purpose, existence as a community, and development as ethnically distinctive peoples. Tribal representatives neither expressed concern about the planning effort nor raised any planning issues. No sacred sites have been identified for Gulf Islands National Seashore either.

Copies of this *General Management Plan* will be forwarded to each associated tribe for review and comment. If subsequent issues or concerns are identified, appropriate consultations would be undertaken.

Other ethnographic resources may be in the national seashore that are associated with certain peoples. These peoples are the contemporary park neighbors and ethnic or occupational communities that have been associated with a park for two or more generations (40 years), and whose interests in the park's resources began before the park's establishment. This general management plan recommends that an ethnographic overview and assessment be undertaken for the national seashore, with particular emphasis on understanding and interpreting the history of African-American, Vietnamese, French, and Spanish communities that were known to be near and have strong association to the national seashore.

Because there are no known ethnographic resources on park lands, and no issues or concerns were raised by associated tribes during scoping, ethnographic resources was dismissed as an impact topic.

Museum Collections

Museum collections (objects, specimens, and archival and manuscript collections) are important park resources in their own right, as well as being valuable for the information they provide about processes, events, and interactions among people and the environment. Natural and cultural objects and their associated records provide baseline data, serving as scientific and historical documentation of the park's resources and purpose. All resource management records that are directly associated with museum objects are managed as museum property. These and other resource management records are preserved as part of the archival and manuscript collection because they document and provide an information base for the continuing management of the park's resources. Museum objects used in exhibits, furnished historic structures, and other

interpretive programs help visitors gain understanding of the events, activities, and people commemorated by the parks.

In the aftermath of the 2004–2005 hurricanes, a program/project agreement was reached between the national seashore and Timucuan Ecological and Historic Preserve to temporarily store some of the national seashore's museum objects within their facility. Other objects damaged during the storms were sent to Harpers Ferry National Historical Park for stabilization and treatment. Some items sent to Harpers Ferry still remain there, and others have since been sent to the Timucuan facility. Museum objects and archived collections from the national seashore's Mississippi District previously housed in the Davis Bayou Visitor Center, which was significantly damaged during Hurricane Katrina in 2005, are currently distributed among Timucuan National Ecological and Historic Preserve or the Southeast Archeological Center or are in rented, climate-controlled storage.

The Southeast Archeological Center is also storing several of the national seashore's archived archeological collections for an indefinite period within their facility. Archeological material currently at the University of West Florida will be relocated to the Southeast Archeological Center upon completion of data analysis. Other repositories may be used subject to the development of appropriate loan agreements. Other museum objects will be transferred to the Pensacola Naval Air Station. Cannonballs are now stored in a facility in Theodore, Alabama. Some archived objects (large wood carvings, signs, etc.) are stored in a rented facility in Pensacola, and some are also being used for display purposes within the Naval Live Oaks and Davis Bayou Visitor Centers.

Much of the national seashore's natural history collection is located at Louisiana State University in Baton Rouge, Louisiana. Natural history collections are also being stored at the University of West Florida in Pensacola; the R. L. Herbarium at the University of Kansas in Lawrence, Kansas; and the Field Museum in Chicago, Illinois.

As set forth in the NPS Southeast Region's "Collections Management Plan," the long-term plan is for all national seashore museum objects currently stored in the Timucuan facility to be relocated to a shared multipark facility to be established at Natchez National Historical Park. This arrangement is conceptual and needs to be funded in order for any transfer of national seashore museum objects to occur. Under the arrangement, Natchez National Historical Park would assume full administrative and curatorial support for the national seashore's cultural, natural history, and archival collections stored in their facility.

During the life of the general management plan the national seashore's museum collections would continue to be moved to facilities, e.g., a university, college, or museum, and housed under state-of-the-art museum standards for fire detection and suppression; security; temperature and humidity control; and curation, storage, and research space. This would be a beneficial, long-term impact on the national seashore's museum collections.

The utmost care would be exercised during the packing, moving, and unpacking of all collections; therefore, potential impacts on the national seashore's museum collections associated with the risk involved in moving artifacts, specimens, and archives would be negligible, adverse, and short term. Moving part of the national seashore's museum collections to a facility outside the national seashore would be less convenient for NPS staff who need to use the collections for research or study—resulting in a negligible, adverse, long-term impact. However, there would be beneficial impacts that would be realized by providing more space for adequate curation, storage, and research.

Because proposed actions affecting museum collections are the same for all alternatives, and any adverse impacts to museum

collections would be negligible, museum collections was dismissed as an impact topic.

NATURAL RESOURCES

Air Quality

Gulf Islands National Seashore is subject to federal, Florida, and Mississippi air regulations. National ambient air quality standards have been established by the Environmental Protection Agency (EPA). Current standards are set for sulfur dioxide, carbon monoxide, nitrogen dioxide, ozone, particulate matter equal to or less than 10 microns in size, fine particulate matter equal to or less than 2.5 microns in size, and lead.

The Clean Air Act of 1963, as amended (42 USC 7401 et seq.) was established to promote the public health and welfare by protecting and enhancing the nation's air quality. The act established specific programs that provide special protection for air resources and air quality-related values associated with NPS units. Section 118 of the Clean Air Act requires parks to meet all state, federal, and local air pollution standards. NPS *Management Policies 2006* addresses the need to analyze potential impacts on air quality during park planning. Gulf Islands National Seashore is listed as a Class II area by Congress.

Areas are classified under the Federal Clean Air Act as either "attainment" or "nonattainment" areas for each criteria pollutant based on whether the national ambient air quality standards have been achieved or not. When an area has been designated as an attainment area after having been a nonattainment area, it is also classified as a maintenance area. The Florida District of Gulf Islands National Seashore is in an attainment area for all criteria pollutant. The Mississippi District of the Gulf Islands National Seashore is in an attainment area for all criteria pollutants (USEPA 2003b).

The Bureau of Ambient Monitoring Sources within the Division of Air Resource Management of the Florida Department of Environmental Protection (FDEP) is responsible for monitoring and evaluating ambient air quality within Florida through a combination of state and federal regulations (FDEP 2003a). The state has adopted the national ambient air quality standards except for more restrictive sulfur dioxide standards.

No air quality monitoring stations are located within the national seashore boundaries. In Florida, ozone is monitored at three locations in Pensacola and one location in Gulf Breeze.

The Air Division of the Office of Pollution within the Mississippi Department of Environmental Quality (MDEQ) is responsible for regulating air quality in the Mississippi stretch of the national seashore through federal regulations. Mississippi has adopted the national ambient air quality standards for the criteria pollutants, and has also adopted a state odor standard (MDEQ 2002). In Mississippi, ozone is monitored at Gulfport.

The National Park Service maintains records of ozone levels, and the NPS Air Resources Division has found that ozone levels in Mississippi and Florida are at levels that could cause foliar damage and growth effects on tree seedlings. Ozone only occasionally exceeds national air quality standards in Mississippi and (EPA 2003a). However, even at low levels, there is a potential for ozone damage to native vegetation (NPS 2002). Gulf Islands National Seashore staff report that ozone damage to plants has not been observed.

None of the actions described in the *General Management Plan* would violate any air quality standard or result in a cumulative net increase of any criteria pollutant under federal or state ambient air quality standards. Implementation of any of the alternatives described in the *General Management Plan* would have negligible effects on air quality, and the national seashore's Class II air quality would be

unaffected. Therefore, air quality was dismissed as an impact topic.

Ecologically Critical Areas

Aside from Fort Pickens Aquatic Preserve and Florida Outstanding Waters, which is addressed under the impact topic "Fish, Wildlife, and Habitat", the alternatives being considered would not affect any designated ecologically critical areas, wild and scenic rivers, or other unique natural resources, as referenced in the Wild and Scenic Rivers Act, *Management Policies 2001*, 40 *Code of Federal Regulations* 1508.27, or the 62 criteria for national natural landmarks. Therefore, this impact topic has been dismissed from further consideration.

Energy Efficiency and Conservation Potential

The National Park Service would continue to implement its policies of reducing costs, eliminating waste, and conserving resources by using energy-efficient and cost-effective technology (NPS *Management Policies* 2006). The National Park Service would continue to look for energy-saving opportunities in all aspects of park operations. Because the National Park Service would promote energy efficiency in an equal manner under any alternative, this impact topic was dismissed from further consideration.

Natural or Depletable Resource Conservation Potential

There would not be measurable differences in natural or depletable resource conservation among the alternatives being considered in this general management plan. Limited construction activities would reduce surface natural resources, such as vegetation and wildlife habitat; however, these effects are addressed under the "Vegetation" and "Fish and Wildlife" sections in "Chapter 4: Environmental Consequences."

Prime and Unique Agricultural Lands

The Council on Environmental Quality's 1980 memorandum on prime and unique farmlands states that prime farmlands have the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. Unique agricultural land is land other than prime farmland that is used for production of specific high-value food and fiber crops. Both categories require that the land be available for farming uses. Lands within Gulf Islands National Seashore are not available for farming and therefore do not meet the definitions. This impact topic has been dismissed from further consideration.

Soundscapes

Director's Order 47: Soundscape Preservation and Noise Management directs parks to address excessive and inappropriate noises. Appropriate noises are those which are consistent with the park's enabling legislation. In the case of Gulf Islands National Seashore, the park was established to protect the barrier island from development and for recreational uses. Visitor experience is a priority of this park according to this enabling legislation. Therefore, the ability to access the park's resources is important to managing the park. Currently, manmade noise is created in the park from vehicles and boats used to access the park for recreational activities. Under all of the alternatives, these uses would continue and would affect the soundscape of this somewhat remote park. However, because of the large extent of the park, these noises would not create excessive noises throughout the park. The noises would occur intermittently, primarily during daylight hours, although these noises would continue to occur over the length of this general management plan. Also, the majority of the park would continue to have a relatively natural soundscape at any given time, as is currently the case. Short-term construction would also occur under all of the alternatives, creating localized, loud noises, but these intrusive noises would not

affect the soundscape in the long term. None of the actions under any of the alternatives would result in long term effects greater than minor, because noise sources would be limited in the park and the soundscape would be predominantly natural sounds. For this reason, soundscapes has been dismissed from further analysis. (Impacts on wilderness soundscapes are addressed under Visitor Use and Experience).

Water Quantity

Analysis of potential impacts on water resources typically includes consideration of both water quality and water quantity. Because no water withdrawals, diversions, or other activities are proposed in the alternatives that would affect water quantity in rivers, ponds, or lakes, this topic was dismissed from detailed analysis.

Floodplains

The preparation of a "Floodplain Statement of Findings" will be required for any action that will result in adverse impacts on floodplains, in compliance with NPS Director's Order 77-2, Floodplain Management.

Surveys for floodplains would be carried out prior to facility development, and the information would be used to avoid or minimize any impacts on floodplains. To prevent water pollution during construction, erosion control measures and storm water management techniques would be used to minimize discharge to floodplains. The use of heavy equipment adjacent to and in waterways would be minimized. If parking areas are paved, an oil/water separator system would be installed.

New facilities and construction would be sited outside floodplains to the extent practicable, or if that is not possible, to otherwise comply with Executive Order 11988 "Floodplain Management."

There will be negligible impacts on floodplains and these impacts do not differ by alternative. A "Floodplain Statement of Findings" will be required for any future work affecting floodplains. Therefore, floodplains was dismissed as an impact topic.

OTHER TOPICS

Environmental Justice

Presidential Executive Order 12898, *General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing the disproportionately high and/or adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. According to the Environmental Protection Agency, environmental justice is the

> . . .fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations and policies. Fair treatment means that no group of people, including a racial, ethnic, or socio-economic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.

The goal of 'fair treatment' is not to shift risks among populations, but to identify potentially disproportionately high and adverse effects and identify alternatives that may mitigate these impacts.

Communities in the vicinity of the national seashore contain both minority and low-income populations; however,

environmental justice is dismissed as an impact topic for the following reasons:

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

The impacts to the socioeconomic environment resulting from implementation of any of the action alternatives would be beneficial. In addition, the Park staff and planning team do not anticipate the impacts on the socioeconomic environment to appreciably alter the physical and social structure of the nearby communities.

Quality of the Built Environment

Limited construction would occur under any of the alternatives. New construction (waysides, kiosks, roads, etc.) would be built so as to match the style and/or enhance the existing park buildings. However, these actions would cause little impact on the built environment, as the park currently has very limited development. Therefore, quality of the built environment was dismissed from further analysis in this assessment.

Indian Trust Resources

The federal Indian trust responsibility is a legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights. There are no Indian trust resources in Gulf Islands National Seashore; therefore, this impact topic has been eliminated from further consideration.

Wilderness Character

The 1964 Wilderness Act protects areas that are largely natural and undeveloped, and that provide outstanding opportunities for solitude or "primitive, unconfined recreation." At Gulf Islands National Seashore, wilderness character is closely tied to visitor use and experience on the designated wilderness islands, Horn and Petit Bois islands. Therefore, this topic has been dismissed as a separate topic, but is discussed under the Visitor Use and Experience sections in "Chapter 3: Affected Environment" and in "Chapter 4: Environmental Consequences."

Carbon Footprint

For the purpose of this planning effort, "carbon footprint" is defined as the sum of all emissions of carbon dioxide and other greenhouse gases (e.g., methane and ozone) that would result from implementation of either of the action alternatives. Understanding the carbon footprint of each alternative is important for determining its contribution to climate change.

It has been determined that the action alternatives described in this document would only emit a negligible amount of greenhouse gases that contribute to climate change; therefore, this impact topic has been dismissed from detailed analysis in this plan. The reasons for dismissing this impact topic are that (1) the alternatives contain no proposals that promote increased vehicular traffic, and (2) changes to facilities are

largely in-kind and should have an overall benefit due to newer sustainable building practices. Because of the negligible amount of greenhouse gas emissions that would result from each alternative, a quantitative measurement of their carbon footprint was determined by the planning team not to be practicable.

ENVIRONMENTAL CONSEQUENCES

GULF ISLANDS NATIONAL SEASHORE

CHAPTER FOUR

INTRODUCTION

The National Environmental Policy Act of 1969 (40 CFR 1500-1508) requires that environmental documents include discussion of the environmental impacts of a proposed federal action, feasible alternatives to that action, and any adverse environmental effects that could not be avoided if a proposed action should be implemented. In this case, the proposed federal action is implementation of the *General Management Plan / Environmental Impact Statement* for Gulf Islands National Seashore. This chapter contains the analysis of the environmental impacts on cultural resources, natural resources visitor experience, the social and economic environment, and national seashore operations, and that would result from the actions of each of the four alternatives. The analysis is the basis for comparing the beneficial and adverse effects that would be caused by implementing each alternative.

Because the actions described in the alternatives are general and conceptual, the impacts of these actions are analyzed in general qualitative terms. Thus, this environmental impact statement should be considered a programmatic analysis. If and when site-specific developments or other actions are proposed for implementation after the *Final General Management Plan* is published and approved, appropriate detailed environmental and cultural compliance documentation will be prepared in accordance with the requirements of the National Environmental Policy Act and the National Historic Preservation Act.

For each topic in this chapter, first, the methods and assumptions are described and then the impacts on the topic that would occur from implementing each alternative are analyzed. Each alternative discussion also includes a description of the cumulative effects, followed by a conclusion. At the end of the impact section there is a brief discussion of the unavoidable adverse impacts, irreversible and irretrievable commitments of resources, the relationship of short-term uses of the environment and the maintenance and enhancement of long-term productivity, and the energy requirements and conservation potential. The impacts of each alternative are briefly summarized in table 4.

TERMS AND ASSUMPTIONS

Each impact topic includes a discussion of impacts, including the intensity, duration, and type of impact. *Intensity* of impact describes the degree, level, or strength of an impact as negligible, minor, moderate, or major. Because definitions of intensity vary by resource topic, separate intensity definitions are provided for each topic. *Duration* of impact considers whether the impact would occur over the short term or long term. Unless otherwise noted, s*hort-term* impacts are those that, within a short period of time—generally less than five years—would no longer be detectable because the resource or value would return to its predisturbance condition or appearance. *Long-term* impacts refer to a change in a resource or value that is expected to persist for five or more years. The *type* of impact refers to whether the impact on the resource or value would be *beneficial* (positive) or *adverse* (negative).

The impact analyses for the action alternatives (alternatives 2, 3, and 4) describe the difference between implementing alternative 1 (the "no-action" alternative) and implementing the action alternatives. In other words, to understand the consequences of any action alternative, the reader must also consider what would happen if no action were taken.

IMPACTS ON CULTURAL RESOURCES AND SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT

In this management plan, impacts on historic structures are described in terms of type,

duration, and intensity, which is consistent with the regulations of the Council on Environmental Quality (CEQ) that implement the National Environmental Policy Act. These impact analyses are intended, however, to comply with the requirements of both that act and Section 106 of the National Historic Preservation Act (NHPA). In accordance with the Advisory Council on Historic Preservation's regulations implementing Section 106 of the National Historic Preservation Act (36 CFR Part 800, *Protection of Historic Properties*), impacts on cultural resources were also identified and evaluated by (1) determining the area of potential effects; (2) identifying cultural resources present in the area of potential effects that are either listed in or eligible to be listed in the National Register of Historic Places; (3) applying the criteria of adverse effect to affected, National Register eligible or listed cultural resources; and (4) considering ways to avoid, minimize, or mitigate adverse effects.

Under the Advisory Council's regulations a determination of either *adverse effect* or *no adverse effect* must also be made for affected National Register listed or eligible cultural resources (historic structures, in this case). An *adverse effect* occurs whenever an action alters, directly or indirectly, any characteristic of a cultural resource that qualifies it for inclusion in the National Register, e.g., diminishing the integrity (or the extent to which a resource retains its historic appearance) of its location, design, setting, materials, workmanship, feeling, or association. Adverse effects also include reasonably foreseeable effects caused by alternative actions that would occur later in time, be farther removed in distance, or be cumulative (36 CFR 800.5, *Assessment of Adverse Effects)*. A determination of *no adverse effect* means there is an effect, but the effect would not diminish the characteristics of the cultural resource that qualify it for inclusion in the National Register.

CEQ regulations and the NPS Director's Order 12: *Conservation Planning, Environmental Impact Analysis and Decision Making* also call for a discussion of mitigation, as well as an analysis of how effective the mitigation would be in reducing the intensity of a potential impact, e.g., reducing the intensity of an impact from major to moderate or minor. Any resultant reduction in intensity of impact due to mitigation, however, is an estimate of the effectiveness of mitigation under the National Environmental Policy Act only. It does not suggest that the level of effect as defined by Section 106 is similarly reduced. Cultural resources are nonrenewable resources, and adverse effects generally consume, diminish, or destroy the original historic materials or form, resulting in a loss in the integrity of the resource that can never be recovered. Therefore, although actions determined to have an adverse effect under Section 106 may be mitigated, the effect remains adverse.

A Section 106 summary is included in the impact analysis sections for historic structures. The Section 106 summary is an assessment of the effect of the undertaking (implementation of the alternative) based upon the criterion of effect and criteria of adverse effect found in the Advisory Council's regulations that implement the National Historic Preservation Act.

CLIMATE CHANGE

The impacts of climate change on the national seashore are not expected to differ among the alternatives, and the lack of quantitative information about climate change effects adds to the difficulty of predicting how these impacts will be realized in the national seashore. Additionally, management actions that are inherently part of each alternative, such as allowing natural processes to dominate, or rebuilding a road after a storm, will not fundamentally change with the anticipated added effects of climate change.

The range of variability in the potential effects of climate change is large in comparison to what is known about the future under an altered climate regime in the national seashore in particular, even if larger-scale climatic patterns have been predicted with confidence

for the Gulf Coast (Ning et al. 2003, Twilley et al. 2001). For example, salt marsh communities may be degraded by sea level rise, while storm frequency and intensity may impact historic resources and visitor amenities. However, climate change is one added factor among many that cause similar outcomes in a barrier island ecosystem, so management actions will not likely be taken due to climate change alone.

Although many specific effects of climate change and the rates of changes are not known at the present time, additional data and climate change modeling will become available during the life of this plan. The best available scientific climate change data and modeling will be incorporated into specific management decisions or actions which may be taken under any of the alternatives described in this plan.

Given this complexity, the potential effects of this dynamic climate on national seashore resources were included in "Chapter 3, Affected Environment." However, they will not be analyzed in detail in "Chapter 4, Environmental Consequences" in general with respect to each alternative because of the uncertainty and variability of outcomes, and because these outcomes or management are not expected to differ among the alternatives. However, under the impact topic of Special Status Species, climate change is discussed because it has implications on listed species management.

CUMULATIVE IMPACTS

The Council on Environmental Quality regulations, implementing the National Environmental Policy Act (NEPA), requires assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions, regardless of who undertakes such other actions. Cumulative impacts can result from individually minor but collectively important actions taking place over a period of time.

Cumulative impacts are considered for all alternatives. These impacts were determined by combining the impacts of the alternatives proposed in this document with the impacts of other past, present, and reasonably foreseeable future actions. To do this, it was necessary to identify other such projects or actions at Gulf Islands National Seashore and in the surrounding area. For the purposes of most impact topics in this analysis, the cumulative impact analysis area was Escambia, Santa Rosa, and Okaloosa counties in Florida, and Harrison and Jackson counties in Mississippi. For other impact topics, the area was the northern Gulf Coast.

The following ongoing projects or projects planned for the near future were identified for the purposes of conducting the cumulative effects analysis (see the "Ongoing NPS Projects and Projects Planned for the Near Future" section in chapter 1 for more information on these actions):

Hurricane Recovery Projects

A number of hurricane recovery projects have been completed, including the following:

- reconstructing the Fort Pickens Road
- repairing and rehabilitating Fort Pickens Building 5
- replacing the Fort Pickens sewer system
- rehabilitating the Fort Pickens water system
- reconstructing the J. Earle Bowden Way
- replacing the water and sewer systems and building at Santa Rosa
- repairing the Davis Bayou Visitor Center and Davis Bayou culvert
- reconstructing the bayou boathouse at Davis Bayou
- reconstructing the West Ship Island buildings and utilities

- reconstructing the Horn Island buildings and utilities

Deepwater Horizon Oil Spill Response

The oil spill response within the national seashore is broad, having extensively involved large spans of shoreline, primarily on the Gulf of Mexico (south) side of both the Florida and Mississippi districts. The oil spill response has been categorized into four phases. See the "Introduction" to "Chapter 3: Affected Environment" for a complete description of the four stages of response activities for the oil spill.

Approximately 89% (about 45 miles) of the national seashore will revert to no further treatment. About 11% (about 6 miles) of the national seashore shoreline on the Gulf of Mexico side will be treated to a depth of up to 18 inches. The recommendation for 89% of the national seashore shoreline areas to convert to no further treatment is based on subsurface surveys and profile summary. This has been completed for Florida, but is still pending for Mississippi. Once that subsurface testing is completed for Mississippi national seashore areas, the national seashore staff will recommend any further treatment. No deep cleaning will be carried out on Horn or Petit Bois islands, as they have no designated recreational beaches.

In addition to the on-the-ground response work, Natural Resource Damage Assessment (NRDA) activities continue. These activities focus on several categories, including: (1) birds; (2) marine mammals and sea turtles); (3) fish and shellfish; (4) deep water habitat; (5) intertidal and near-shore subtidal habitats, including subaquatic vegetation or seagrass beds; (6) terrestrial animals, and (7) human uses of natural resources (recreational fishing, boating, etc.) Pre-assessment activities continue at the time of writing of this general management plan, and exposure and resulting injury determinations are not made until the next phase of the process.

It is not known yet whether oil spill activities will have short- or long-term impacts (major or minor) on all the resources and plans described in this document. For the purposes of general management planning, oil response activities on the Florida and Mississippi barrier islands of the national seashore have been included in this general management plan. Other activities and impacts will not be addressed, as they are part of the NRDA legal inquiry, or out of the scope of this plan.

U.S. Army Corps of Engineers Dredging Activities

Large dredging activities have taken place or are taking place at Pensacola Pass, Pascagoula Pass, on the Intracoastal Waterway, and on other ship channels. Spoils from dredging are stockpiled on national seashore lands as well as on spoil islands.

Beach replenishment activities have occurred in adjacent communities and to protect national seashore historic forts.

Mississippi Coastal Improvement Program

This program is a comprehensive plan for coastal improvements in Mississippi, including structural, nonstructural, and environmental projects. The areas of Gulf Island National Seashore that will be affected by this project are Cat, Horn, Petit Bois, West Ship, and East Ship islands. These islands will receive sand or littoral zone replenishment, generally on the southern side of each island.

Private Dredging Activities

Private dredging activities have been undertaken to access the boat channel to Cat Island as well as interior canals throughout the island.

IMPAIRMENT OF NATIONAL SEASHORE RESOURCES

In addition to determining the environmental consequences of implementing the preferred and other alternatives, NPS *Management Policies 2006* (section 1.4) requires analysis of potential effects to determine whether or not

proposed actions would *impair* National Seashore resources and values.

The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. NPS managers must seek ways to avoid, or to minimize to the greatest degree practicable, adverse impacts on park resources and values. However, the laws do give NPS managers discretion to allow impacts on park resources and values when necessary and appropriate to fulfill the purposes of the park, as long as the impact does not constitute impairment of the affected resources and values. That discretion is limited by the statutory requirement that the National Park Service must leave resources and values unimpaired unless a particular law directly and specifically provides otherwise.

The prohibited impairment is an impact that would, in the professional judgment of the responsible NPS manager, harm the integrity of a park unit's resources or values, and violate the 1916 NPS Organic Act's mandate (NPS *Management Policies 2006* 1.4.5). An impact on a park unit's resource or value may, but does not necessarily, constitute an impairment. An impact is more likely to constitute impairment to the extent that it affects a resource or value whose conservation is

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park, or
- key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park, or
- identified in the park's general management plan or other relevant NPS planning documents as being of significance.

An impact would be less likely to constitute impairment if it is an unavoidable result of an action necessary to preserve or restore the integrity of park resources or values and it cannot be further mitigated.

Impairment may result from visitor activities; NPS administrative activities; or activities undertaken by concessioners, contractors, and others operating in the park unit. Impairment may also result from sources or activities outside the park unit. A determination on impairment is made for each impact topic related to the park unit's cultural and natural resources. A determination of impairment is not required for impact topics such as visitor experience, regional socioeconomics, and NPS operations. The determination of impairment for the preferred alternative is found in appendix C.

IMPACTS ON HISTORIC STRUCTURES

METHODS AND ASSUMPTIONS FOR ANALYZING IMPACTS

Historic structures are addressed in this section because many of the proposed actions in the alternatives would affect their use and maintenance.

The no-action alternative, alternative 1, serves as the baseline condition against which all action alternatives are evaluated. Alternative 1 might have impacts associated with current management trends, and those impacts are described below under "Impacts of Implementing Alternative 1." The impacts on historic structures in the action alternatives were evaluated by comparing projected changes resulting from the action alternatives to the no-action alternative. The thresholds to determine the level of impact on historic structures are defined as follows:

Negligible: Impacts would be at the lowest levels of detection—barely perceptible and measurable. For purposes of Section 106, the determination of effect would be *no adverse effect*.

Minor: Impacts would affect character-defining features but would not diminish the overall integrity of the building or structure. For purposes of Section 106, the determination of effect would be *no adverse effect*.

Moderate: Impacts would alter a character-defining feature(s), diminishing the overall integrity of the building or structure to the extent that its National Register eligibility could be jeopardized. For purposes of Section 106, the determination of effect would be *adverse effect*.

Major: Impacts would alter character-defining features, diminishing the integrity of the building or structure to the extent that it would no longer be eligible to be listed on the National Register. For purposes of Section 106, the determination of effect would be *adverse effect*.

IMPACTS OF IMPLEMENTING ALTERNATIVE 1

Fort Pickens Area

Rehabilitation of historic structures, such as the historic firehouse and mining casemate, to support visitor services could necessitate the removal or relocation of walls and the installation of new electrical, water, and HVAC (heating, ventilation, and air-conditioning) services. Interpretive activities would continue to be provided in the Fort Pickens Area, including the masonry fort and historic frame and brick structures. These activities would occur primarily within the structures but could occur outside as part of a tour. There could be some rehabilitation to the structures to provide appropriate conditions for tours.

Rehabilitation work would be undertaken in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (*Secretary of the Interior's Standards*). This would ensure that the character-defining features and integrity of the structures would be minimally affected and that any adverse effects would be long term and of negligible to minor intensity. Any materials removed during the rehabilitation efforts would be evaluated to determine their value to the national seashore's museum collection and/or for their comparative use in future preservation work at the national seashore. Rehabilitation efforts would have impacts that are adverse, long term, and minor in intensity because of the loss of historic fabric.

Fort Pickens could be impacted by wear and tear from increased visitation, but monitoring the user capacity of historic structures could result in visitation levels or constraints that would contribute to the stability or and integrity of the resources without unduly hindering interpretation for visitors. Unstaffed or minimally staffed structures could be more susceptible to vandalism.

However, continued ranger patrols and emphasis on visitor education would discourage vandalism and inadvertent destruction of historic fabric. Any adverse impacts would be long term and negligible to minor in intensity.

Naval Air Station / Fort Barrancas

Any continuation of the stabilization work occurring at Fort Barrancas, Bateria de San Antonio (Water Battery), and the Advanced Redoubt would generally focus on the ongoing maintenance and repair of historic materials and features rather than extensive replacement or new construction. Also, continued limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work would be appropriate. The work would be done in accordance with the *Secretary of Interior's Standards*. Stabilization efforts would have impacts that are beneficial and long term.

Fort Barrancas, Bateria de San Antonio (Water Battery), and the Advanced Redoubt could be impacted by wear and tear from increased visitation, but monitoring the user capacity of historic structures could result in visitation levels or constraints that would contribute to the stability or and integrity of the resources without unduly hindering interpretation for visitors. Unstaffed or minimally staffed structures could be more susceptible to vandalism. However, continued ranger patrols and emphasis on visitor education would discourage vandalism and inadvertent destruction of historic fabric. Any adverse impacts would be long term and negligible to minor in intensity.

If management of the Pensacola Lighthouse is transferred to the National Park Service, the lighthouse keeper's quarters, outbuildings, and associated lands would fall upon the National Park Service. Because both government agencies are guided by the same laws for managing cultural resources, transferring those responsibilities to the National Park Service would have no new impact on these historic structures.

Perdido Key

Interpretive signs would be developed at Fort McRee; Batteries 233, Center, and Slemmer; and the sea wall. None of these signs would be affixed to the historic structures or physically impact them. As a result there would be no effect on any of these historic structures.

Maintaining unrestricted use, including boating access and overnight camping at the east end of Perdido Key, would continue to allow visitors unregulated access and opportunities for destructive activities at the historic Fort McRee; Batteries 233, Center, and Slemmer; and the sea wall. Ongoing impacts, such as the presence of graffiti and the results of a lack of sanitation facilities, would result in impacts that are adverse, long term, and minor in intensity because of visitor use of the area.

Fort McRee; Batteries 233, Center, and Slemmer; and the sea wall could be impacted by wear and tear from increased visitation, but monitoring the user capacity of historic structures could result in visitation levels or constraints that would contribute to the stability or and integrity of the resources without unduly hindering interpretation for visitors. Unstaffed or minimally staffed structures could be more susceptible to vandalism. However, continued ranger patrols and emphasis on visitor education would discourage vandalism and inadvertent destruction of historic fabric. Any adverse impacts would be long term and negligible to minor in intensity.

West Ship Island

Fort Massachusetts would be stabilized, and the North Guard Rooms would be rehabilitated for use as a visitor contact area; provisions for Eastern National operations, such as moveable display cases and shelves, would also be made in this location. This adaptive reuse could result in impacts such as rehabilitating walls or installing temporary partition walls. Other actions, such as installation of new electrical, water, and HVAC service,

might also be needed. The stabilization work would have long-term, beneficial impacts. The rehabilitation work would be undertaken in accordance with the *Secretary of the Interior's Standards*. This would ensure that the character-defining features and integrity of the structure would be minimally affected, and that any adverse effects because of the loss of historic fabric would be long term and negligible to minor in intensity.

Similar to the North Guard Rooms, the South Guard Room of Fort Massachusetts would provide for visitor orientation through an orientation film. This adaptive reuse could result in limited impacts such as rehabilitating existing walls or installing temporary partition walls. Other actions, such as installation of new electrical, water, and HVAC service, might also be needed. Rehabilitation work would be undertaken in accordance with the *Secretary of the Interior's Standards*. This would ensure that the character-defining features and integrity of the structure are minimally affected and that any adverse effects because of the loss of historic fabric would be long term and negligible to minor in intensity.

New interpretive wayside signs and an orientation kiosk would be developed at West Ship Island in the area of Fort Massachusetts. None of these signs would be affixed to the historic structure or physically impact it. Additionally the kiosk would be located in a manner that would not affect the historic fort. Careful design would ensure that the kiosk would have little effect on the scale and visual relationships between the kiosk and the fort. In addition, the topography and land use patterns of the area would remain unaltered. As a result there would be no effect on historic structures.

Guided and self-guided tours of the fort would occur in this alternative. These activities would occur both inside and outside the walls of the fort. There could be some rehabilitation to the structure to provide appropriate conditions for tours. Rehabilitation efforts would have impacts that are adverse, long term, and negligible to minor in intensity because of the loss of historic fabric.

Historic structures could be impacted by wear and tear from increased visitation, but monitoring the user capacity of historic structures could result in visitation levels or constraints that would contribute to the stability and integrity of the resources without unduly hindering interpretation for visitors. Unstaffed or minimally staffed structures could be more susceptible to vandalism. However, continued ranger patrols and emphasis on visitor education would discourage vandalism and inadvertent destruction of historic fabric. Any adverse impacts would be long term and negligible to minor in intensity.

The beach nourishment necessary to protect the foundations and walls of Fort Massachusetts would continue. Nourishment would consist of adding new sand around the base of the fort where sand has been removed through erosion. Over time the loss of sand exposes the masonry to the Gulf Coast waters and could result in the loss of the fort's brick and mortar. Replacing this sand would have short-term, beneficial impacts on historic structures.

Cumulative Impacts

Pensacola Naval Air Station Historic District, a national historic landmark near but not within the national seashore boundary, originally contained 55 structures, although not all of these are still standing today. Hurricane Ivan (2004) damaged 16 buildings, 6 of which were repaired and 10 of which were razed. This demolition of 10 structures adversely affected the historic character of the district. Since Hurricane Ivan, some consideration has been given to reevaluating the district and potentially removing it from the National Register because the characteristics that caused it to be designated originally appear to have been lost or destroyed. Removing the historic district from the National Register would have an adverse, moderate, long term impact because the

structures would no longer be protected under the National Historic Preservation Act.

As described above, implementation of the no-action alternative would result in impacts on historic structures that are adverse, long term, and of negligible to minor intensity, as well as impacts that are long term and beneficial. Combined with the long-term, adverse, moderate impacts of other past, present or reasonably foreseeable actions, the cumulative impact would be adverse, long term, and of minor intensity. Although the cumulative impact would be adverse, adverse impacts on historic structures resulting from implementing the no-action alternative would be a small component of that cumulative impact.

Conclusion

Implementation of the no-action alternative would result in impacts on historic structures that are adverse, long term, and of negligible to minor intensity because of the proposed rehabilitation work that would result in the loss of historic fabric. Stabilization work would be beneficial and long term. Cumulative impacts would be adverse, minor, and long term. The contribution of this alternative to those cumulative impacts would be small.

Section 106 Summary

After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR Part 800.5, *Assessment of Adverse Effects*), the National Park Service concludes the proposed undertakings outlined in the no-action alternative would have *no adverse effect* on historic structures.

IMPACTS OF IMPLEMENTING ALTERNATIVE 2

Fort Pickens Area

Rehabilitation of historic structures, such as the historic firehouse and mining casemate, to support visitor services could necessitate the removal or relocation of walls and the installation of new electrical, water, and HVAC services. Interpretive activities would continue to be provided in the Fort Pickens Area, including the masonry fort and historic frame and brick structures. These activities would occur primarily within the structures but could occur outside as part of a tour. There could be some rehabilitation to the structures to provide appropriate conditions for tours.

Rehabilitation work would be undertaken in accordance with the *Secretary of the Interior's Standards*. This would ensure that the character-defining features and integrity of the structures would be minimally affected and that any adverse effects would be long term and of negligible to minor intensity. Any materials removed during the rehabilitation efforts would be evaluated to determine their value to the national seashore's museum collection and/or for their comparative use in future preservation work at the national seashore. Rehabilitation efforts would have impacts that are adverse, long term, and minor in intensity because of the loss of historic fabric.

Fort Pickens could be impacted by wear and tear from increased visitation, but monitoring the user capacity of historic structures could result in visitation levels or constraints that would contribute to the stability and integrity of the resources without unduly hindering interpretation for visitors. Unstaffed or minimally staffed structures could be more susceptible to vandalism. However, continued ranger patrols and emphasis on visitor education would discourage vandalism and inadvertent destruction of historic fabric. Any adverse impacts would be long term and negligible to minor in intensity.

Naval Air Station / Fort Barrancas

Any continuation of the stabilization work occurring at Fort Barrancas, Bateria de San Antonio (Water Battery), and the Advanced Redoubt would generally focus on the ongoing maintenance and repair of historic materials and features rather than extensive replacement or new construction. Also, continued limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work would be appropriate. The work would be done in accordance with the *Secretary of Interior's Standards*. Stabilization efforts would have beneficial and long-term impacts.

In this alternative the lighthouse complex would be managed as an unstaffed feature of the national seashore, and the exterior would be interpreted upon completion of the transfer of management responsibilities from the Coast Guard to the National Park Service. Interpretation of the exterior of the fort and lighthouse structures would not impact the structures and would result in no effect on any of the structures.

Historic structures could be impacted by wear and tear from increased visitation, but monitoring the user capacity of historic structures could result in visitation levels or constraints that would contribute to the stability and integrity of the resources without unduly hindering interpretation for visitors. Unstaffed or minimally staffed structures could be more susceptible to vandalism. However, continued ranger patrols and emphasis on visitor education would discourage vandalism and inadvertent destruction of historic fabric. Any adverse impacts would be long term and negligible to minor in intensity.

Perdido Key

Interpretive signs would be developed at Fort McRee; Batteries 233, Center, and Slemmer; and the sea wall. None of these signs would be affixed to the historic structures or physically impact them. As a result there would be no effect on any of these historic structures.

Implementation of a permit system for landings and overnight moorings may result in fewer visitors in the area of the historic Fort McRee; Batteries 233, Center, and Slemmer; and the sea wall. Fewer visitors may result in a reduction in graffiti and people relieving themselves on the remnant structures, but the impacts would still be adverse, long-term, and negligible in intensity because of visitor use of the area.

West Ship Island

Fort Massachusetts would be stabilized, and the North Guard Rooms would be rehabilitated for use as a visitor contact area; provisions for Eastern National operations, such as moveable display cases and shelves, would also be made in this location. This adaptive reuse could result in impacts such as rehabilitating walls or installing temporary partition walls. Other actions, such as installation of new electrical, water, and HVAC service, might also be needed. The stabilization work would have long-term, beneficial impacts. The rehabilitation work would be undertaken in accordance with the *Secretary of the Interior's Standards*. This would ensure that the character-defining features and integrity of the structure would be minimally affected and that any adverse effects because of the loss of historic fabric would be long term and negligible to minor in intensity.

Similar to the North Guard Rooms, the South Guard Room of Fort Massachusetts would provide a visitor orientation film. This adaptive reuse could result in limited impacts such as rehabilitating existing walls or installing temporary partition walls. Other actions, such as installation of new electrical, water, and HVAC service, might also be needed. Rehabilitation work would be undertaken in accordance with the *Secretary of the Interior's Standards*. This would ensure that the character-defining features and integrity of the structure would be minimally affected and that any adverse effects because of the loss of

historic fabric would be long term and negligible to minor in intensity.

New interpretive wayside signs and an orientation kiosk would be developed at West Ship Island in the area of Fort Massachusetts. None of these signs would be affixed to the historic structure or physically impact them. Also, the kiosk would be located in a manner that would not affect the historic fort. Careful design would ensure that the kiosk would have little effect on the scale and visual relationships between the kiosk and the fort. In addition, the topography and land use patterns of the area would remain unaltered. As a result there would be no effect on the historic structures.

Guided and self-guided tours of the fort would occur in this alternative. These activities would occur both inside and outside the walls of the fort. There could be some rehabilitation to the structure to provide appropriate conditions for tours. Rehabilitation efforts would have impacts that are adverse, long term, and negligible to minor in intensity because of the loss of historic fabric.

Historic structures could be impacted by wear and tear from increased visitation, but monitoring the user capacity of historic structures could result in visitation levels or constraints that would contribute to the stability and integrity of the resources without unduly hindering interpretation for visitors. Unstaffed or minimally staffed structures could be more susceptible to vandalism. However, continued ranger patrol and emphasis on visitor education would discourage vandalism and inadvertent destruction of historic fabric. Any adverse impacts would be long term and negligible to minor in intensity.

The beach nourishment necessary to protect the foundations and walls of Fort Massachusetts would continue. Nourishment would consist of adding new sand around the base of the fort where sand has been removed through erosion. Over time the loss of sand exposes the masonry to the Gulf Coast waters and could result in the loss of the fort's brick and mortar. Replacing this sand would have short-term, beneficial impacts on historic structures.

Cumulative Impacts

Pensacola Naval Air Station Historic District, a national historic landmark near but not within the national seashore boundary, originally contained 55 structures, although not all of these are still standing today. Hurricane Ivan (2004) damaged 16 buildings, 6 of which were repaired and 10 of which were razed. This demolition of 10 structures adversely affected the historic character of the district. Since Hurricane Ivan, some consideration has been given to reevaluating the district and potentially removing it from the National Register because the characteristics that caused it to be designated originally appear to have been lost or destroyed. Removing the historic district from the National Register would have an adverse, moderate, long-term impact because the structure would no longer be protected under the National Historic Preservation Act.

As described above, implementation of alternative 2 would result in impacts on historic structures that are adverse, long term, and of negligible to minor intensity, as well as impacts that are long term and beneficial. Combined with the long-term, adverse, moderate impacts of other past, present or reasonably foreseeable actions, the cumulative impact would be adverse, long term, and of minor intensity. Although the cumulative impact would be adverse, adverse impacts on historic structures resulting from implementing alternative 2 would be a small component of that cumulative impact.

Conclusion

Implementation of alternative 2 would result in impacts on historic structures that are adverse, long term, and of negligible to minor intensity because of the proposed rehabilitation work that would result in the loss of historic fabric. Stabilization work would be

beneficial and long term. Cumulative impacts would be adverse, minor, and long term. The contribution of this alternative to those cumulative impacts would be small.

Section 106 Summary

After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR Part 800.5, *Assessment of Adverse Effects*), the National Park Service concludes the proposed undertakings outlined in alternative 2 would have *no adverse effect* on historic structures.

IMPACTS OF IMPLEMENTING ALTERNATIVE 3

Fort Pickens Area

Rehabilitation of historic structures, such as the historic firehouse and mining casemate, to support visitor services could necessitate the removal or relocation of walls and the installation of new electrical, water, and HVAC services. Interpretive activities would continue to be provided in the Fort Pickens Area, including the masonry fort and historic frame and brick structures. These activities would occur primarily in the structures but could occur outside as part of a tour. There could be some rehabilitation to the structures to provide appropriate conditions for tours.

Rehabilitation work would be undertaken in accordance with the *Secretary of the Interior's Standards*. This would ensure that the character-defining features and integrity of the structures would be minimally affected and that any adverse effects would be long term and of negligible to minor intensity. Any materials removed during the rehabilitation efforts would be evaluated to determine their value to the national seashore's museum collection and/or for their comparative use in future preservation work at the national seashore. Rehabilitation efforts would have impacts that are adverse, long term, and minor in intensity because of the loss of historic fabric.

This alternative would (1) continue to adaptively reuse a portion of Fort Pickens for visitor contact and historic building FL5 for interpretive, educational, and other operational support, and (2) use Battery Cooper for interpretive programs. If needed for these purposes, relocating and rehabilitating walls and/or installing new electrical, water, and HVAC service throughout the buildings would be undertaken. Rehabilitation work would follow the *Secretary of the Interior's Standards*. This would ensure that the character-defining features and integrity of the structures would be minimally affected and that any adverse effects because of the loss of historic fabric would be long term and of negligible to minor intensity.

The interior of the Fort Pickens Ranger Station would be rehabilitated for orientation and educational purposes. The historic exteriors would be restored to their original appearance/function. There could be additional interpretive exhibits installed inside the buildings. If needed for these purposes, relocating and rehabilitating walls and installing new electrical, water, and HVAC service throughout the buildings would be undertaken. Rehabilitation and restoration work would follow the *Secretary of the Interior's Standards*. This would ensure that the character-defining features and integrity of the structures would be minimally affected and that any adverse effects because of the loss of historic fabric would be long term and of negligible to minor intensity.

Historic structures could be impacted wear and tear from increased visitation, but monitoring the user capacity of historic structures could result in visitation levels or constraints that would contribute to the stability and integrity of the resources without unduly hindering interpretation for visitors. Unstaffed or minimally staffed structures could be more susceptible to vandalism. However, continued ranger patrol and emphasis on visitor education would discourage vandalism and inadvertent destruction of historic fabric. Any adverse impacts would be long term and negligible to minor in intensity.

Other portions of Fort Pickens might also be rehabilitated to portray the historic appearance and/or function. If needed for these purposes, relocating and rehabilitating walls and/or installing new electrical, water, and HVAC service throughout the buildings would be undertaken. Rehabilitation work would follow the *Secretary of the Interior's Standards*. This would ensure that the character-defining features and integrity of the structures would be minimally affected and that any adverse effects because of the loss of historic fabric would be long term and of negligible to minor intensity. Additional interpretive exhibits could be added, which would have no impact on historic structures.

Naval Air Station / Fort Barrancas

Selected portions of Fort Barrancas, Bateria de San Antonio (Water Battery), and the Advanced Redoubt would be restored to portray their appearance and/or function during specific historic operational periods. These actions would be undertaken in accordance with the *Secretary of Interior's Standards*. This would ensure that the character-defining features and integrity of the structures would be minimally affected and that any adverse effects because of the loss of historic fabric would be long term and of negligible to minor intensity.

Interpretive and educational activities would be provided at Fort Barrancas, Bateria de San Antonio (Water Battery), and the Advanced Redoubt. These activities would occur primarily within the structures, but could occur outside as part of a tour. No effects on historic structures would be expected from such interpretive presentations.

If management of the Pensacola Lighthouse were transferred to the National Park Service, it would be managed for interpretative purposes and might contain several staff offices. The exterior of the structures would be used as the setting for visitor interpretation. Interpretation of the exterior of the fort and lighthouse complex would not impact, either directly or indirectly, any of the buildings or grounds and would therefore result in no effect on any of the structures.

The interior of the lighthouse keeper's quarters would be developed for use as a visitor contact station, bookstore, and possibly staff office space. There could also be visitor access and interpretation of the lighthouse interior in this alternative. Adaptively reused in this way, these structures could be altered, if needed, through relocating and rehabilitating walls and/or installing new electrical, water, and HVAC service. Any rehabilitation work undertaken would be done in accordance with the *Secretary of Interior's Standards*. This would ensure that the character-defining features and integrity of the structures would be minimally affected and that any adverse effects because of the loss of historic fabric would be long-term and of negligible to minor intensity.

Interpretive exhibits and activities would be developed within portions of the Advanced Redoubt and could include wayside signs, and displays of historic activities. None of these exhibits would be affixed to the historic structures, and these activities would not physically impact the historic structures. As a result there would be no effect on any of these historic structures.

Historic structures could be impacted by wear and tear from increased visitation, but monitoring the user capacity of historic structures could result in visitation levels or constraints that would contribute to the stability and integrity of the resources without unduly hindering interpretation for visitors. Unstaffed or minimally staffed structures could be more susceptible to vandalism. However, continued ranger patrol and emphasis on visitor education would discourage vandalism and inadvertent destruction of historic fabric. Any adverse impacts would be long term and negligible to minor in intensity.

Perdido Key

Providing composting or vault toilet facilities on the eastern end of Perdido Key near the remnant military structures associated with Fort McRee; Batteries 233, Center, and Slemmer; and the sea wall would reduce the likelihood of visitors relieving themselves on these remnant structures. Providing these sanitation facilities would most likely result in long-term beneficial impacts on historic structures.

Interpretive signs would be developed at Fort McRee; Batteries 233, Center, and Slemmer; and the sea wall. None of these signs would be affixed to the historic structures or physically impact them. As a result there would be no effect on any of these historic structures.

Permitting boat landings and overnight moorings may result in fewer visitors in the area of the historic Fort McRee; Batteries 233, Center, and Slemmer; and the sea wall. Fewer visitors may result in a reduction in graffiti and people relieving themselves on the remnant structures, but the impacts would still be adverse, long-term, and negligible in intensity because of visitor use of the area.

Providing on-site interpretive programs at the historic Fort McRee; Batteries 233, Center, and Slemmer; and the sea wall would occur in this alternative. These activities would occur outside the remnant structures as part of tours or interpretive talks that explain their historic significance and the importance of preserving the remnant structures. No effects on historic structures would be expected from such interpretive presentations.

Historic structures could be impacted by wear and tear from increased visitation, but monitoring the user capacity of historic structures could result in visitation levels or constraints that would contribute to the stability and integrity of the resources without unduly hindering interpretation for visitors. Unstaffed or minimally staffed structures could be more susceptible to vandalism. However, continued ranger patrol and emphasis on visitor education would discourage vandalism and inadvertent destruction of historic fabric. Any adverse impacts would be long term and negligible to minor in intensity.

West Ship Island

Fort Massachusetts would be stabilized, and the North Guard Rooms would be rehabilitated for use as a visitor contact area; provisions for Eastern National operations, such as moveable display cases and shelves, would also be made in this location. This adaptive reuse could result in impacts such as rehabilitating walls or installing temporary partition walls. Other actions, such as installation of new electrical, water, and HVAC service, might also be needed. The stabilization work would have long-term, beneficial impacts. The rehabilitation work would be undertaken in accordance with the *Secretary of the Interior's Standards*. This would ensure that the character-defining features and integrity of the structure would be minimally affected and that any adverse effects because of the loss of historic fabric would be long term and negligible to minor in intensity.

Similar to the North Guard Rooms, the South Guard Room of Fort Massachusetts would provide for a visitor orientation film. This adaptive reuse could result in limited impacts, such as rehabilitating existing walls or installing temporary partition walls. Other actions, such as installation of new electrical, water, and HVAC service, might also be needed. Rehabilitation work would be undertaken in accordance with the *Secretary of the Interior's Standards*. This would ensure that the character-defining features and integrity of the structure are minimally affected and that any adverse effects because of the loss of historic fabric would be long term and negligible to minor in intensity.

New interpretive wayside signs and an orientation kiosk would be developed at West Ship Island in the area of Fort Massachusetts. None of these signs would be affixed to the historic structure or physically impact it. Also, the kiosk would be located in a manner that

would not affect the historic fort. Careful design would ensure that the kiosk would have little effect upon the scale and visual relationships between the kiosk and the fort. In addition, the topography and land use patterns of the area would remain unaltered. As a result there would be no effect on historic structures.

Guided and self-guided interpretive tours of the fort would occur in this alternative. These activities would occur both inside and outside the walls of the fort. There could be some rehabilitation to the structure to provide appropriate conditions for tours. Rehabilitation efforts would have impacts that are adverse, long term, and negligible to minor in intensity because of the loss of historic fabric. There would be no impacts on historic structures from interpretive presentations.

Historic structures could be impacted by wear and tear from increased visitation, but monitoring the user capacity of historic structures could result in visitation levels or constraints that would contribute to the stability and integrity of the resources without unduly hindering interpretation for visitors. Unstaffed or minimally staffed structures could be more susceptible to vandalism. However, continued ranger patrol and emphasis on visitor education would discourage vandalism and inadvertent destruction of historic fabric. Any adverse impacts would be long term and negligible to minor in intensity.

To enhance visitor understanding of the role Fort Massachusetts played in our country's history, in this alternative certain portions of the fort would be restored to reflect a scene of its historic operational period. Such actions as repointing masonry and reproducing original hardware would be undertaken. To accomplish this, all work would be done in conformance with the *Secretary of Interior's Standards* so that the form, features, and materials would depict the fort as it appeared during its period of use by the military. The work would result in impacts that are adverse, long term, and negligible to minor in intensity because of the loss of historic fabric.

As part of this alternative, cannon firing demonstrations would be conducted. The cannons would likely be placed on top of the fort in their historic locations. Although designed in the 1860s to withstand the repeated concussive forces generated by the firing of cannons during an armed engagement, the exposure to the corrosive effects of salt spray, more than 130 years of weathering storms, and general deterioration of mortar and brick may have weakened the structure. Additional analysis would be necessary to determine whether reinforcement would be needed to resist transmitting vibrations throughout the structure. If it is determined that additional structural reinforcement was required, and depending upon the level of intrusion into the original fabric necessary, adverse impacts on Fort Massachusetts would range from minor to moderate and be long term.

The beach nourishment necessary to protect the foundations and walls of Fort Massachusetts would continue. Nourishment would consist of adding new sand around the base of the fort where sand has been removed through erosion. Over time the loss of sand exposes the masonry to the Gulf Coast waters and could result in the loss of the fort's brick and mortar. Replacing this sand would have short-term beneficial impacts on historic structures.

Cumulative Impacts

Pensacola Naval Air Station Historic District, a national historic landmark near but not within the national seashore boundary, originally contained 55 structures, although not all of these are still standing today. Hurricane Ivan (2004) damaged 16 buildings, 6 of which were repaired and 10 of which were razed. This demolition of 10 structures adversely affected the historic character of the district. Since Hurricane Ivan, some consideration has been given to reevaluating the district and potentially removing it from the National Register because the characteristics that caused it to be designated originally appear to have been lost or destroyed.

Removing the historic district from the National Register would have an adverse, moderate, long-term impact because the structures would no longer be protected under the National Historic Preservation Act.

As described above, implementation of alternative 3 would result in impacts on historic structures that are adverse, long term, and of negligible to minor intensity, as well as impacts that are long term and beneficial. Combined with the long-term, adverse, moderate impacts of other past, present or reasonably foreseeable actions, the cumulative impact would be adverse, long term, and of minor intensity. Although the cumulative impact would be adverse, adverse impacts on historic structures resulting from alternative 3 would be a small component of that cumulative impact.

Conclusion

Implementation of alternative 3 would result in impacts to historic structures that are adverse, long term, and of negligible to minor intensity because of the proposed rehabilitation work that would result in the loss of historic fabric. Stabilization work would be beneficial and long term. Cumulative impacts would be adverse, minor, and long term. The contribution of this alternative to those cumulative impacts would be small.

Section 106 Summary

After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR Part 800.5, *Assessment of Adverse Effects*), the National Park Service concludes the proposed undertakings outlined in alternative 3 would have *no adverse effect* on historic structures.

IMPACTS OF IMPLEMENTING ALTERNATIVE 4

Fort Pickens Area

Rehabilitation of historic structures, such as the historic firehouse and mining casemate, to support visitor services could necessitate the removal or relocation of walls and the installation of new electrical, water, and HVAC services. Interpretive activities would continue to be provided in the Fort Pickens Area, including the masonry fort and historic frame and brick structures. These activities would occur primarily in the structures but could occur outside as part of a tour. There could be some rehabilitation to the structures to provide appropriate conditions for tours.

Rehabilitation work would be undertaken in accordance with the *Secretary of the Interior's Standards*. This would ensure that the character-defining features and integrity of the structures would be minimally affected and that any adverse effects would be long term and of negligible to minor intensity. Any materials removed during the rehabilitation efforts would be evaluated to determine their value to the national seashore's museum collection and/or for their comparative use in future preservation work at the national seashore. Rehabilitation efforts would have impacts that are adverse, long term, and minor in intensity because of the loss of historic fabric.

This alternative would (1) continue to adaptively reuse a portion of Fort Pickens for visitor contact and historic building FL5 for interpretive, educational, and other operational support, and (2) use Battery Cooper for interpretive programs. If needed for these purposes, relocating and rehabilitating walls and/or installing new electrical, water, and HVAC service throughout the buildings would be undertaken. Rehabilitation work would follow the *Secretary of the Interior's Standards*. This would ensure that the character-defining features and integrity of the structures would be minimally affected and that any adverse effects because of loss of

historic fabric would be long term and of negligible to minor intensity.

The interior of the Fort Pickens Ranger Station and accompanying garage would be rehabilitated for orientation and educational purposes. The historic exteriors would be returned to their original appearance/function. There could be additional interpretive exhibits installed inside the buildings. If needed for these purposes, relocating and rehabilitating walls and/or installing new electrical, water, and HVAC service throughout the buildings would be undertaken. Rehabilitation work would follow the *Secretary of the Interior's Standards*. This would ensure that the character-defining features and integrity of the structures would be minimally affected and that any adverse effects because of loss of historic fabric would be long term and of negligible to minor intensity.

Historic structures could be impacted by wear and tear from increased visitation, but monitoring the user capacity of historic structures could result in visitation levels or constraints that would contribute to the stability and integrity of the resources without unduly hindering interpretation for visitors. Unstaffed or minimally staffed structures could be more susceptible to vandalism. However, continued ranger patrol and emphasis on visitor education would discourage vandalism and inadvertent destruction of historic fabric. Any adverse impacts would be long term and negligible to minor in intensity.

Other portions of Fort Pickens might also be rehabilitated to portray the historic appearance and/or function. If needed for these purposes, relocating and rehabilitating walls and/or installing new electrical, water, and HVAC service throughout the buildings would be undertaken. Rehabilitation work would follow the *Secretary of the Interior's Standards*. This would ensure that the character-defining features and integrity of the structures would be minimally affected and that any adverse effects because of the loss of historic fabric would be long term and of negligible to minor intensity. Additional interpretive exhibits could be added, which would have no impact on historic structures.

In partnership with the national seashore, a consortium of universities would fund and manage a shared educational and research facility within adaptively rehabilitated historic structures of Fort Pickens. If needed for these purposes, relocating and rehabilitating walls and/or installing new electrical, water, and HVAC service throughout the buildings would be undertaken. Rehabilitation work would follow the *Secretary of the Interior's Standards*. This would ensure that the character-defining features and integrity of the structures would be minimally affected and that any adverse effects because of the loss of historic fabric would be long term and of negligible to minor intensity.

Naval Air Station / Fort Barrancas

Selected portions of Fort Barrancas, Bateria de San Antonio (Water Battery), and the Advanced Redoubt would be restored to portray their appearance and/or function during specific historic operational periods. These actions would be undertaken in accordance with the *Secretary of Interior's Standards*. This would ensure that the character-defining features and integrity of the structures would be minimally affected and that any adverse effects because of the loss of historic fabric would be long term and of negligible to minor intensity.

Interpretive and educational activities would be provided at Fort Barrancas, Bateria de San Antonio (Water Battery), and the Advanced Redoubt. These activities would occur primarily within the structures, but could occur outside as part of a tour. No effects on historic structures would be expected from such interpretive presentations.

If management of the Pensacola Lighthouse were transferred to the National Park Service, it would be managed as an unstaffed feature of the national seashore. The exterior of the structures would be used as the setting for visitor interpretation. Interpretation of the

exterior of the fort and lighthouse complex would not impact, either directly or indirectly, any of the buildings or grounds and would therefore result in no effect on any of the structures.

The interior of the lighthouse keeper's quarters would be developed for use as a visitor contact station and bookstore. There could also be visitor access and interpretation of the lighthouse interior in this alternative. Adaptively reused in this way, these structures could be altered, if needed, through relocating and rehabilitating walls and/or installing new electrical, water, and HVAC service. Rehabilitation work would follow the *Secretary of the Interior's Standards*. This would ensure that the character-defining features and integrity of the structures would be minimally affected and that any adverse effects because of the loss of historic fabric would be long term and of negligible to minor intensity.

Interpretive exhibits and activities would be developed within portions of the Advanced Redoubt and could include wayside signs and displays of historic activities. None of these exhibits would be affixed to the historic structures, and these activities would not physically impact the historic structures. As a result there would be no effect on any historic structures.

Historic structures could be impacted by wear and tear from increased visitation, but monitoring the user capacity of historic structures could result in visitation levels or constraints that would contribute to the stability and integrity of the resources without unduly hindering interpretation for visitors. Unstaffed or minimally staffed structures could be more susceptible to vandalism. However, continued ranger patrol and emphasis on visitor education would discourage vandalism and inadvertent destruction of historic fabric. Any adverse impacts would be long term and negligible to minor in intensity.

Perdido Key

Providing composting or vault toilet facilities on the eastern end of Perdido Key near the remnant military structures associated with Fort McRee; Batteries 233, Center, and Slemmer; and the sea wall would reduce the likelihood of visitors relieving themselves on these remnant structures. Providing these sanitation facilities would most likely result in long-term beneficial impacts on historic structures.

Interpretive signs would be developed at Fort McRee; Batteries 233, Center, and Slemmer; and the sea wall. None of these signs would be affixed to the historic structures or physically impact them. As a result there would be no effect on any of these historic structures.

Providing on-site interpretive programs at the historic Fort McRee; Batteries 233, Center, and Slemmer; and the sea wall would occur in this alternative. These activities would occur outside the remnant structures as part of tours or interpretive talks that would explain their historic significance and the importance of preserving the remnant structures. No effects on historic structures would be expected from such interpretive presentations.

Historic structures could be impacted by wear and tear from increased visitation, but monitoring the user capacity of historic structures could result in visitation levels or constraints that would contribute to the stability and integrity of the resources without unduly hindering interpretation for visitors. Unstaffed or minimally staffed structures could be more susceptible to vandalism. However, continued ranger patrol and emphasis on visitor education would discourage vandalism and inadvertent destruction of historic fabric. Any adverse impacts would be long term and negligible to minor in intensity.

Developing a permit system for overnight camping and the mooring of boats and implementing a permit system to control landings on the eastern end of Perdido Key may result in fewer visitors in the area of the

historic Fort McRee; Batteries 233, Center, and Slemmer; and the sea wall. Fewer visitors might result in a reduction in graffiti and people relieving themselves on the remnant structures, but the impacts would still be adverse, long-term, and negligible in intensity because of visitor use of the area.

West Ship Island

Fort Massachusetts would be stabilized, and the North Guard Rooms would be rehabilitated for use as a visitor contact area; provisions for Eastern National operations, such as moveable display cases and shelves, would also be made in this location. This adaptive reuse could result in impacts such as rehabilitating walls or installing temporary partition walls. Other actions, such as installation of new electrical, water, and HVAC service, might also be needed. The stabilization work would have long-term, beneficial impacts. The rehabilitation work would be undertaken in accordance with the *Secretary of the Interior's Standards*. This would ensure that the character-defining features and integrity of the structure would be minimally affected and that any adverse effects because of the loss of historic fabric would be long term and negligible to minor in intensity.

Similar to the North Guard Rooms, the South Guard Room of Fort Massachusetts would have a visitor orientation film. This adaptive reuse could result in limited impacts, such as rehabilitating existing walls or installing temporary partition walls. Other actions, such as installation of new electrical, water, and HVAC service, might also be needed. Rehabilitation work would be undertaken in accordance with the *Secretary of the Interior's Standards*. This would ensure that the character-defining features and integrity of the structure would be minimally affected and that any adverse effects because of the loss of historic fabric would be long term and negligible to minor in intensity.

New interpretive wayside signs and an orientation kiosk would be developed at West Ship Island in the area of Fort Massachusetts. None of these signs would be affixed to the historic structure or physically impact it. Also, the kiosk would be located in a manner that would not affect the historic fort. Careful design would ensure that the kiosk would have little effect upon the scale and visual relationships between the kiosk and the fort. In addition, the topography and land use patterns of the area would remain unaltered. As a result there would be no effect on historic structures.

Guided and self-guided interpretive tours of the fort would occur in this alternative. These activities would occur both inside and outside the walls of the fort. There could be some rehabilitation to the structure to provide appropriate conditions for tours. Rehabilitation efforts would have impacts that are adverse, long-term, and negligible to minor in intensity due to loss of historic fabric. There would be no adverse impacts to historic structures from interpretive presentations.

Historic structures could be impacted by wear and tear from increased visitation, but monitoring the user capacity of historic structures could result in visitation levels or constraints that would contribute to the stability and integrity of the resources without unduly hindering interpretation for visitors. Unstaffed or minimally staffed structures could be more susceptible to vandalism. However, continued ranger patrol and emphasis on visitor education would discourage vandalism and inadvertent destruction of historic fabric. Any adverse impacts would be long term and negligible to minor in intensity.

To enhance visitor understanding of the role Fort Massachusetts played in our country's history, in this alternative certain portions of the fort would be restored to reflect a scene of its historic operational period. Such actions as repointing masonry and reproducing original hardware would be undertaken. To accomplish this, all work would be done in conformance with the *Secretary of Interior's Standards* so that the form, features, and materials would depict the fort as it appeared

during its period of use by the military. The work would result in impacts that would be adverse, long term, and negligible to minor in intensity because of the loss of historic fabric.

As part of this alternative, cannon firing demonstrations would be conducted. The cannons would likely be placed on top of the fort in their historic locations. Although designed in the 1860s to withstand the repeated concussive forces generated by the firing of cannons during an armed engagement, the exposure to the corrosive effects of salt spray, more than 130 years of weathering storms, and general deterioration of mortar and brick may have weakened the structure. Additional analysis would be necessary to determine whether reinforcement would be needed to resist transmitting vibrations throughout the structure. If it is determined that additional structural reinforcement was required, and depending upon the level of intrusion into the original fabric necessary, adverse impacts on Fort Massachusetts would range from minor to moderate and be long term.

The beach nourishment necessary to protect the foundations and walls of Fort Massachusetts would continue. Nourishment would consist of adding new sand around the base of the fort where sand has been removed through erosion. Over time the loss of sand exposes the masonry to the Gulf Coast waters and could result in the loss of the fort's brick and mortar. Replacing this sand would have short-term beneficial impacts on historic structures.

Cumulative Impacts

Pensacola Naval Air Station Historic District, a national historic landmark near but not within the national seashore boundary, originally contained 55 structures, although not all of these are still standing today. Hurricane Ivan (2004) damaged 16 buildings, 6 of which were repaired and 10 of which were razed. This demolition of 10 structures adversely affected the historic character of the district. Since Hurricane Ivan, some consideration has been given to reevaluating the district and potentially removing it from the National Register because the characteristics that caused it to be designated originally appear to have been lost or destroyed. Removing the historic district from the National Register would have an adverse, moderate, long-term impact because the structures would no longer be protected under the National Historic Preservation Act.

As described above, implementation of alternative 4 would result in impacts on historic structures that are adverse, long term, and of negligible to minor intensity, as well as impacts that are long term and beneficial. Combined with the long-term, adverse, moderate impacts of other past, present or reasonably foreseeable actions, the cumulative impact would be adverse, long term, and of minor intensity. Although the cumulative impact would be adverse, adverse impacts on historic structures resulting from alternative 4 would be a small component of the cumulative effect.

Conclusion

Implementation of alternative 4 would result in impacts on historic structures that are adverse, long term, and of negligible to minor intensity because of the proposed rehabilitation work that would result in the loss of historic fabric. Stabilization work would be beneficial and long term. Cumulative impacts would be adverse, minor, and long term. The contribution of this alternative to those cumulative impacts would be small.

Section 106 Summary

After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR Part 800.5, *Assessment of Adverse Effects*), the National Park Service concludes the proposed undertakings outlined in alternative 4 would have *no adverse effect* on historic structures.

IMPACTS ON GEOLOGIC PROCESSES

METHODS AND ASSUMPTIONS FOR ANALYZING IMPACTS

Geologic processes are addressed in this section, primarily in terms of barrier island and coastal plain geomorphology. Because barrier islands are geologically dynamic environments, many of the proposed actions could affect natural geologic processes.

The no-action alternative, alternative 1, serves as the baseline condition against which all action alternatives are evaluated. Alternative 1 may have impacts associated with current management trends, and those impacts have been described. The impacts on geologic processes were evaluated by comparing projected changes resulting from the action alternatives to the no-action alternative. The thresholds to determine the level of impact on these resources are defined as follows:

Negligible Impact: An action would result in change to a geologic resource or geologic process. The change would be so small that it would not be detectable based on standard scientific method. Disruptions to key geologic processes would be well within the natural range of variability.

Minor Impact: An action would result in a change to a geologic resource or geologic process. The change would be detectable, but small, localized, and of little consequence. Monitoring would likely detect changes to the features, and the loss of associated contextual information would be minimal. Disruptions to key geologic processes would be within the natural range of variability.

Moderate Impact: An action would result in a change to a geologic resource or geologic process. The change would be measurable, readily apparent, and of consequence. Some features and/or associated contextual information would be lost. Disruptions to key geologic processes may be outside the natural range of variability.

Major Impact: An action would result in a substantial or widespread loss or alteration of geologic features or processes. The change would be measurable and result in an adverse impact. Disruptions to key geologic processes are expected to be outside the natural range of variability and may be permanent.

IMPACTS OF IMPLEMENTING ALTERNATIVE 1

Florida District Areas

Naval Live Oaks. Under the no-action alternative, no effects on geologic processes would occur at Naval Live Oaks as a result of continued management and use of this area.

Perdido Key. The presence of the road would continue minor to moderate, long-term, adverse effects on natural geologic processes.

The presence of the road would continue to affect dune formation and dune migration. Because dunes are an integral component of the barrier island system that absorb the force of waves and contain the sand necessary to continue the barrier island geologic/dune processes, impacts on natural dune formation and migration would continue to be adverse. Additionally, the presence of a flat, hardened surface in the sandy barrier island environment would continue to increase the scouring action of storms and the effects of erosion by further removing sand from the island. Because fill would be required in many cases following a storm to repair road damage and elevate the road surface, there would be further risk of introducing additional foreign material. Windblown and waterborne barrier island sediment is finely separated and sifted as part of the natural processes. New material may not have the same grain coarseness or consistency as the existing naturally developed sands, which would exacerbate adverse effects on the natural processes. Any

type of armoring or other protection of the road from storms would further exacerbate adverse impacts on the natural geologic processes.

Fort Pickens. Similar to Perdido Key and Santa Rosa Island, the presence of the road would continue minor to moderate, long-term, adverse effects on natural geologic processes.

Santa Rosa Island. Similar to Perdido Key and Fort Pickens, the presence of the road would continue minor to moderate, long-term adverse, effects on natural geologic processes.

Mississippi District Areas

Davis Bayou. Under the no-action alternative, the presence of roads with inadequate culverts would continue to disrupt soil and sediment transport, resulting in moderate, long-term, adverse effects on natural geologic processes.

By constricting the natural flow of streams and drainages, the combination of an elevated roadway and inadequate culverts causes ponding on the upstream side and scouring/channelization on the downstream or outlet side of the culvert. The ponding of water combined with the scouring action continues to result in sedimentation and erosion, which disrupts the natural geologic/geomorphic processes.

Cat Island. Continued NPS and private boat use would disrupt the natural shoaling processes at Cat Island, resulting in minor, long-term, adverse effects on natural geologic processes. The submerged sands at Cat Island form shallow shoals surrounding most of the island. Boat propellers scour these shallow shoals near the canal when boats enter or leave the canal, thus disrupting and altering the natural geologic processes. If propeller-driven boats did not access the island, this shoaling process would continue unabated.

East and West Ship Islands. Continued unrestricted boat landings would impact seagrass beds. Because seagrass beds serve as a sediment stabilizer, impacts on these beds destroy this function, resulting in minor, long-term, adverse effects on island geomorphology and natural geologic processes.

Horn and Petit Bois Islands. Similar to the Ship Islands, continued unrestricted boat landings would continue to result in minor, long-term, adverse effects on island geomorphology and natural geologic processes.

Cumulative Impacts

Continued introduction of gravel and asphalt debris over the long term have had a moderate adverse effect on natural geologic processes. All areas of the national seashore with a surfaced road are similarly affected by the accumulation of nonnative materials.

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on geologic resources may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of oil collected. These impacts may be minor to moderate in intensity.

Acceptance of dredged sand from Pensacola Pass has required and would continue to require careful management to ensure that sediment loads are carefully balanced. Deposition in the middle of the island is permissible if sand meets necessary criteria. Dredging occurs every 3 to 5 years. The exact long-term impacts of this action are not well understood.

When the Mississippi Coastal Improvement Program is implemented, the National Park Service's acceptance of dredged sand as replenishment near the Ship Islands would likely prevent accelerated erosion of the islands that has been occurring since the dredging of shipping channels. These conditions would continue to have short- to long-

term moderate beneficial effects on island geomorphology and geologic processes.

Overall, the combined effects of these past, present, and future actions would be beneficial and minor in intensity.

The effects of other past, present and future actions, when combined with the minor to moderate, long-term, adverse effects of actions proposed in alternative 1, would result in cumulative effects that are both adverse and beneficial and moderate in intensity. Alternative 1 would contribute a modest adverse impact on these overall cumulative impacts.

Conclusion

Implementation of the no-action alternative would result in the continuation of minor to moderate, long-term, adverse effects on natural geologic processes from roads and minor, long-term, adverse effects on island shape and natural geologic processes from unrestricted boat landings. Cumulative effects would be beneficial and minor in intensity.

IMPACTS OF IMPLEMENTING ALTERNATIVE 2

Florida District Areas

Naval Live Oaks. Under alternative 2, no effects on geologic processes would occur at Naval Live Oaks as a result of proposed management actions or use of this area.

Perdido Key. If the road is washed out and not replaced, the effects of this action would create moderate, long-term, beneficial effects. Removal of the road would benefit natural processes such as dune formation, dune migration, and vegetation colonization. With these conditions restored, wave action during severe storms would occur under more natural conditions, benefiting the natural dune processes.

Fort Pickens. Impacts would be similar to those described for Perdido Key.

Santa Rosa Island. The presence of the road would continue to cause minor to moderate, long-term, adverse effects on natural geologic processes, although, following a severe storm that washes the road out, the two-lane road would be replaced with a one-lane road that has a smaller footprint compared to existing conditions.

The presence of the road would continue to affect dune formation and dune migration. Because dunes are an integral component of the barrier island system that absorb the force of waves and contain the sand necessary to continue the barrier island geologic/dune processes, impacts on natural dune formation and migration would continue to be adverse. Additionally, the presence of a flat, hardened surface in the sandy barrier island environment would continue to increase the scouring action of storms and the effects of erosion by further removing sand from the island. Following storms, the introduction of hardened roadway debris into the sandy island would continue to further alter the natural geologic process, again by increasing erosion and changing the natural dynamic of sediment transport. Because fill would be required in many cases following a storm to repair road damage and elevate the road surface, there would be further risk of introducing additional foreign material. Wind-blown and waterborne barrier island sediment is finely separated and sifted as part of the natural processes. New material may not have the same grain coarseness or consistency as the existing naturally developed sands, which would exacerbate adverse effects on the natural processes. Any type of armoring or other protection of the road from storms would further exacerbate adverse impacts on the natural geologic processes.

Mississippi District Areas

Davis Bayou. Under alternative 2, the replacement of inadequate culverts with appropriately sized culverts or bridging structures would restore more natural water flows. It would also allow more natural soil

and sediment transport, and reduce erosion caused by improperly sized culverts. This would result in moderate, long-term, beneficial effects to geologic processes in the vicinity of the culverts.

Cat Island. Increased and expanded NPS and private boat use would disrupt the natural shoaling processes at Cat Island. The submerged sands at Cat Island form shallow shoals surrounding most of the island. Boat propellers scour these shallow shoals when boats enter or leave the canal, thus disrupting and altering the natural geologic processes. Increased boat activity would also increase shoreline erosion as a result of wave action. Additional dredging would be required to accommodate increased boating demand. These actions would result in minor to moderate, long-term, adverse effects on natural geologic processes.

East and West Ship Islands. The proposed nonmotorized primitive visitor opportunities zone would protect seagrass beds by prohibiting motorized boating activities within seagrass habitat areas. Because seagrass beds stabilize sediment and are currently being impacted, this management action and associated zone would improve the overall condition of this habitat and of the actual seagrass beds, thereby improving the stabilization function. This improved condition would result in minor, long-term, beneficial effects on island geomorphology and natural geologic processes.

Horn and Petit Bois Islands. Impacts anticipated on these islands would be similar to those described for the Ship islands.

Cumulative Impacts

Continued introduction of gravel and asphalt debris over the long term have had a moderate adverse effect on natural geologic processes. All areas of the national seashore with a surfaced road are similarly affected by the accumulation of nonnative materials. Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on geologic resources may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of oil collected. These impacts may be minor to moderate in intensity.

Acceptance of dredged sand from Pensacola Pass has required and would continue to require careful management to ensure that sediment loads are carefully balanced. Deposition in the middle of the island is permissible if sand meets necessary criteria. Dredging occurs every 3-5 years. The exact long-term impacts of this action are not well understood.

When the Mississippi Coastal Improvement Program is implemented, the National Park Service's acceptance of dredged sand as replenishment near the Ship Islands would likely prevent accelerated erosion of the islands that has been occurring since the dredging of shipping channels. These conditions would continue to have short- to long-term moderate beneficial effects on island geomorphology and geologic processes.

Overall, the combined effects of these past, present, and future actions would be beneficial and minor in intensity.

The effects of other past, present and future actions, when combined with the several moderate, long-term, beneficial impacts and a long-term minor to moderate adverse impact of actions proposed in alternative 2, would be moderate and both adverse and beneficial cumulative effects. Alternative 2 would contribute a small adverse impact and a noticeable beneficial impact to these cumulative effects.

Conclusion

Implementing alternative 2 would result in several moderate, long-term, beneficial impacts and a long-term minor to moderate adverse impact on island geomorphology and natural geologic processes. Cumulative effects would be minor and beneficial in intensity.

IMPACTS OF IMPLEMENTING ALTERNATIVE 3

Florida District Areas

Naval Live Oaks. Under alternative 3, no effects on geologic processes would occur at Naval Live Oaks as a result of proposed management actions or use of this area.

Perdido Key. If the road is washed out and not replaced, the effects of this action would result in moderate, long-term, beneficial effects. Removal of the road would benefit natural processes such as dune formation, dune migration, and vegetation colonization. With these conditions restored, wave action during severe storms would occur under more natural conditions, benefiting the natural dune processes.

Fort Pickens. The presence of the road would continue to result in moderate, long-term, adverse effects on natural geologic processes.

The presence of the road would continue to affect dune formation and dune migration. Because dunes are an integral component of the barrier island system that absorb the force of waves and contain the sand necessary to continue the barrier island geologic/dune processes, impacts on natural dune formation and migration would continue to be adverse. Additionally, the presence of a flat, hardened surface in the sandy barrier island environment would continue to increase the scouring action of storms and the effects of erosion by further removing sand from the island. Following storms, the introduction of hardened roadway debris into the sandy island would continue to further alter the natural geologic process, again by increasing erosion and changing the natural dynamic of sediment transport. Because fill would be required in many cases following a storm to repair road damage and elevate the road surface, there would be further risk of introducing additional foreign material. Therefore, the impacts of rebuilding the road could be moderate or greater depending on the circumstances of the storms and reconstruction. Windblown and waterborne barrier island sediment is finely separated and sifted as part of the natural processes. New material may not have the same grain coarseness or consistency as the existing naturally developed sands, which would exacerbate adverse effects on the natural processes. Any type of armoring or other protection of the road from storms would further exacerbate adverse impacts on the natural geologic processes.

Santa Rosa Island. As described under Fort Pickens, the presence of the road on this island would continue to result in moderate, long-term, adverse effects on natural geologic processes.

Mississippi District Areas

Davis Bayou. Under alternative 3, the replacement of inadequate culverts with appropriately sized culverts or bridging structures would restore more natural water flows. It would also allow more natural soil and sediment transport, and reduce erosion caused by improperly sized culverts. This would result in moderate, long-term, beneficial effects to geologic processes in the vicinity of the culverts.

Cat Island. Increased and expanded NPS and private boat use would disrupt the natural shoaling processes at Cat Island. The submerged sands at Cat Island form shallow shoals surrounding most of the island. Boat propellers scour these shallow shoals near the canal when boats enter or leave the canal, thus disrupting and altering the natural geologic processes. Increased boat activity would also increase shoreline erosion as a result of wave action. Additional dredging would be required

to accommodate increased boating demand. These actions would result in minor to moderate, long-term, adverse effects on natural geologic processes.

East and West Ship Islands. The proposed seagrass bed protection zone would protect seagrass beds by possibly restricting motorized boating activities within habitat areas if impacts on these beds continue to occur. This improved condition would result in negligible to minor, long-term, beneficial effects on island geomorphology and natural geologic processes. Although this protection strategy would be an improvement over existing conditions, because it is based on a discretionary management action following further impacts, it does not provide the same level of protection as the mandatory nonmotorized primitive visitor opportunities zone proposed in alternative 2. Because seagrass beds serve as a sediment stabilizer and are currently being impacted, this management action would improve the overall condition of this habitat and of the actual beds, thereby improving the stabilization function.

Horn and Petit Bois Islands. Impacts anticipated on these islands would be similar to those described for the Ship islands.

Cumulative Impacts

Continued introduction of gravel and asphalt debris over the long term have had a moderate adverse effect on natural geologic processes. All units of the national seashore with a surfaced road are similarly affected by the accumulation of nonnative materials.

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on geologic resources may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of oil collected. These impacts may be minor to moderate in intensity.

Acceptance of dredged sand from Pensacola Pass has required and would continue to require careful management to ensure that sediment loads are carefully balanced. Deposition in the middle of the island is permissible if sand meets necessary criteria. Dredging occurs every 3-5 years. The exact long-term impacts of this action are not well understood.

When the Mississippi Coastal Improvement Program is implemented, the National Park Service's acceptance of dredged sand as replenishment near the Ship Islands would likely prevent accelerated erosion of the islands that has been occurring since the dredging of shipping channels. These conditions would continue to have short- to long-term moderate beneficial effects on island geomorphology and geologic processes.

Overall, the combined effects of these past, present, and future actions would be beneficial and minor in intensity.

The effects of other past, present and future actions, when combined with the moderate, long-term, beneficial impacts and moderate, long-term, adverse impacts of actions proposed in alternative 3, would result in moderate adverse and beneficial cumulative impacts. Alternative 3 would contribute modest adverse impacts and a slight beneficial impact to these cumulative impacts.

Conclusion

Implementing alternative 3 would result in moderate, long-term, beneficial impacts and moderate, long-term, adverse impacts on island geomorphology and natural geologic processes. Cumulative effects would be moderate adverse and moderate beneficial.

IMPACTS OF IMPLEMENTING ALTERNATIVE 4

Florida District Units

Naval Live Oaks. Under alternative 4, the proposed paved trail on the south side of Highway 98 would alter dune dynamics, resulting in minor, long-term, adverse impacts on natural geologic processes.

Perdido Key. The continued presence of the road would continue to result in minor to moderate, long-term, adverse effects on natural geologic processes.

The presence of the road would continue to affect dune formation and dune migration. Because dunes are an integral component of the barrier island system that absorb the force of waves and contain the sand necessary to continue the barrier island geologic/dune processes, impacts on natural dune formation and migration would continue to be adverse. Additionally, the presence of a flat, hardened surface in the sandy barrier island environment would continue to increase the scouring action of storms and the effects of erosion by further removing sand from the island. Following storms, the introduction of hardened roadway debris into the sandy island would continue to further alter the natural geologic process, again by increasing erosion and changing the natural dynamic of sediment transport. Because fill would be required in many cases following a storm to repair road damage and elevate the road surface, there would be further risk of introducing additional foreign material. Windblown and waterborne barrier island sediment is finely separated and sifted as part of the natural processes. New material may not have the same grain coarseness or consistency as the existing naturally developed sands, which would exacerbate adverse effects on the natural processes. Any type of armoring or other protection of the road from storms would further exacerbate adverse impacts on the natural geologic processes.

Fort Pickens. The presence of the road would continue to result in minor to moderate, long-term, adverse effects on natural geologic processes, similar to the Perdido Key Area.

Santa Rosa Island. The presence of the road would continue to result in minor to moderate, long-term, adverse effects on natural geologic processes, similar to the Perdido Key and Fort Pickens Areas.

Mississippi District Areas

Davis Bayou. Under alternative 4, the replacement of inadequate culverts with appropriately sized culverts or bridging structures would restore more natural water flows. It would also allow more natural soil and sediment transport, and reduce erosion caused by improperly sized culverts. This would result in moderate, long-term, beneficial effects to geologic processes in the vicinity of the culverts.

The proposed dredging operation under alternative 4 to keep boat channels open would result in moderate, short-term, adverse effects on natural geologic processes by moving sand and sediment to accommodate increased use by paddlers, fishers, and larger boats.

Cat Island. This alternative would increase boat use the most compared to all other alternatives, causing disruption of the natural shoaling processes at Cat Island. The submerged sands at Cat Island form shallow shoals surrounding most of the island. Boat propellers scour these shallow shoals near the canal when boats enter or leave the canal, disrupting and altering the natural geologic processes. If propeller-driven boats did not access the island, this shoaling process would continue unabated. Increased access and boating activity would require additional dredging. Increased boat activity would also increase shoreline erosion as a result of wave action. These actions would result in minor to moderate, long-term, adverse effects on natural geologic processes.

East and West Ship Islands. The proposed seagrass bed protection zone would protect seagrass beds by possibly restricting motor-

ized boating activities within habitat areas if impacts on these beds continue to occur. This improved condition would result in negligible to minor, long-term, beneficial effects on island geomorphology and natural geologic processes. Although this protection strategy would be an improvement over existing conditions, because it is based on a discretionary management action following further impacts, it does not provide the same level of protection as the mandatory nonmotorized primitive visitor opportunities zone proposed in alternative 2. Because seagrass beds serve as a sediment stabilizer and are currently being impacted, this management action would improve the overall condition of this habitat and of the actual beds, thereby improving the stabilization function.

Horn and Petit Bois Islands. The anticipated impacts would be similar to those described for the Ship islands.

Cumulative Impacts

Continued introduction of gravel and asphalt debris over the long term have had a moderate adverse effect on natural geologic processes. All units of the national seashore with a surfaced road are similarly affected by the accumulation of nonnative materials.

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on geologic resources may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of oil collected. These impacts may be minor to moderate in intensity.

Acceptance of dredged sand from Pensacola Pass has required and would continue to require careful management to ensure that sediment loads are carefully balanced. Deposition in the middle of the island is permissible if sand meets necessary criteria. Dredging occurs every 3-5 years. The exact long-term impacts of this action are not well understood.

When the Mississippi Coastal Improvement Program is implemented, the National Park Service's acceptance of dredged sand as replenishment near the Ship Islands would likely prevent accelerated erosion of the islands that has been occurring since the dredging of shipping channels. These conditions would continue to have short- to long-term moderate beneficial effects on island geomorphology and geologic processes.

Overall, the combined effects of these past, present, and future actions would be beneficial and minor in intensity.

The effects of other past, present and future actions, combined with the moderate, long-term adverse impacts and minor, long-term beneficial impacts of actions proposed in alternative 4, would result in both adverse and beneficial and moderate cumulative effects. Alternative 4 would contribute modest adverse impacts and a slight beneficial impact to these cumulative effects.

Conclusion

Implementing alternative 4 would result in moderate, long-term, adverse impacts and a minor, long-term, beneficial impact on island geomorphology and natural geologic processes. Cumulative effects would be moderate adverse and moderate beneficial.

IMPACTS ON SOILS

METHODS AND ASSUMPTIONS FOR ANALYZING IMPACTS

The effects of the alternatives on soils have been analyzed based on the possibility of impacts resulting from visitor use and development. The thresholds to determine the intensity of impacts are defined as follows:

Negligible Impact: An action would result in a highly localized change in a soil, and the change would be so small that it would not be detectable. The effects on the soil productivity would not be perceptible.

Minor Impact: An impact that would result in a detectable change, but the change would be slight and localized. Effects on soil productivity would be slight. There could be changes in a soil's profile in a relatively small area, but the change would not noticeably increase the potential for erosion.

Moderate Impact: An impact that would result in a clearly detectable change in the soil character and properties over a relatively wide area. The effect on soil productivity would be apparent. The potential for erosion to remove small quantities of additional soil would noticeably increase or decrease.

Major Impact: An impact that would result in a substantial change in the soil character and soil productivity over a large area. There would be a strong likelihood that erosion would remove large quantities of additional soil or that erosion would be substantially reduced.

IMPACTS OF IMPLEMENTING ALTERNATIVE 1

Florida District Areas

Naval Live Oaks. Under the no-action alternative, localized impacts on soils to temporarily accommodate trailer office space for displaced Fort Pickens employees would continue to create negligible short-term adverse effects on soils. Once the road is rebuilt, the office trailers would be removed and the site restored. This would be a long-term, negligible, beneficial impact on soils.

Pensacola Naval Air Station Historic Sites. There would be no change in the pre-Hurricane Ivan development footprint, and therefore there would be no new effects on soils.

Perdido Key. Effects would be the same as for the Pensacola Naval Air Station Historic Site.

Fort Pickens. There would be no change in the pre-Hurricane Ivan development footprint. Therefore there would be no new effects on soils.

Santa Rosa Island. Visitors would continue to walk off trail and create unauthorized trails over natural sand dunes. These activities exacerbate wind and water erosion, causing negligible to minor, long-term, adverse effects on soils.

Okaloosa. There would be no change in the pre-Hurricane Ivan development footprint, and therefore there would be no new impacts on soils.

Mississippi District Areas

Davis Bayou. Under the no-action alternative, pavement in the areas west of the visitor center would continue to result in runoff and erosion of soils especially during storms, resulting in minor to moderate, long-term, adverse effects. Additionally, improperly sized culverts (culverts that are too small to adequately move water) are disrupting soil and sediment transport by causing water to pond and channelizing natural water flow. Moderate, long-term, adverse effects on soils and natural soil processes from these conditions would continue.

Cat Island. Visitor use would continue not to be managed, resulting in unrestricted boat landings and unregulated visitor-created trails over dunes and other features. These conditions lead to soil compaction and erosion and have negligible to minor, long-term, adverse effects on soils.

East and West Ship Islands. On West Ship Island, there are access routes for administrative vehicle use through dunes and a road running through a wetland that is used by a tractor to move materials from the northern shore of the island to the southern shore. Continued use of these roads would have minor, long-term adverse effects on soils.

Campers on East Ship Island gather and use dead and down woody material for campfires, preventing this organic material from returning to the soil, which further depletes soils of critical nutrients and has minor to moderate, long-term, adverse effects on soils.

Unrestricted boat traffic and landings on both islands, but primarily on East Ship Island, affect shoreline marshes and fragile peat banks that are easily eroded by this activity. These conditions continue to have minor to moderate, long-term, adverse effects on soils.

Horn and Petit Bois Islands. Where camping occurs on these islands, dead and down woody material is used for campfires. This use prevents this organic material from returning to the soil, which further depletes soils of these critical nutrients and continues to have minor to moderate, long-term adverse effects on soils. Unrestricted boat traffic and landings on both islands affect shoreline marshes and fragile peat banks that are easily eroded by this activity, and minor to moderate, long-term, adverse effects on soils would continue. Additional impacts that occur as a result of unrestricted boat landings relate to the fact that visitor use is not appropriately managed, which results in unregulated visitor-created trails over dunes and other features. These activities lead to soil compaction and erosion and have negligible to minor, long-term, adverse effects on soils. The current development footprint and administrative activity on Horn Island would continue to have negligible, long-term, adverse effects on soils.

Cumulative Impacts

Gravel and asphalt debris from road construction and maintenance that has accumulated over the long term would continue to have a moderate adverse effect on soils because these foreign materials are being integrated into the natural soil regimen and they affect the soil consistency, texture, and chemistry. All areas of the national seashore with a surfaced road are similarly affected by the accumulation of nonnative materials.

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on soil resources may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of oil collected. These impacts may be minor to moderate in intensity.

Unauthorized ORV use has been occurring between Pensacola Beach and Fort Pickens when the road is destroyed by storms, creating minor adverse effects on soils. Visitors walking off trails have created unauthorized trails over natural sand dunes. These conditions have exacerbated wind and water erosion and would likely continue to result in negligible to minor adverse effects on soils.

Overall, the combined effects of these past, present, and future actions would be adverse and minor in intensity.

The effects of other past, present, and future actions, when combined with the negligible to moderate adverse impacts on soils from actions proposed in alternative 1, would have adverse and minor cumulative impacts. Alternative 1 would contribute modest adverse impacts to these cumulative impacts.

Conclusion

Implementing the no-action alternative would continue to have long-term, negligible to moderate, adverse impacts on national seashore soils. The overall cumulative effects would be adverse and minor in intensity.

IMPACTS OF IMPLEMENTING ALTERNATIVE 2

Florida District Areas

Naval Live Oaks. Under alternative 2, localized impacts on soils would occur as a result of campground use being expanded, which would result in negligible, long-term, adverse effects on soils. Expansion of the maintenance complex would occur where the entire soil surface is currently covered with gravel. Therefore, no changes in soil condition would occur within the maintenance complex.

The replacement of impermeable paved surfaces with permeable paved surfaces in parking areas would substantially reduce surface water runoff by capturing rainwater and permitting it to infiltrate back into the ground. This reduction in surface water runoff would decrease the rate of erosion in drainage channels and streambeds, resulting in long-term, minor, beneficial effects on soils.

Pensacola Naval Air Station Historic Sites. The Woodland Trail would be closed and the natural conditions would be restored, which would improve the natural soil function and condition and have negligible to minor, long-term, beneficial effects on soils.

Perdido Key. Johnson Beach Road would be removed following a destructive storm, and the natural conditions would be restored. These actions would improve the natural soil function and condition and have minor, long term, beneficial effects on soils.

Fort Pickens. Fort Pickens Road, the carpenter's shop, and the Campground Store would be removed following a destructive storm, and natural conditions would be restored. These actions would improve the natural soil function and condition and have long-term, moderate, beneficial effects on soils.

Santa Rosa Island. The reduction of the developed footprint on Santa Rosa Island following a destructive storm would provide the potential for site restoration to natural conditions in many locations and would also reduce foot traffic over dunes. These actions would improve the natural soil function and condition and have minor, long-term, beneficial effects on soils.

Okaloosa. There would be no change in the pre-Hurricane Ivan development footprint. Therefore, there would be no new effects on soils.

Mississippi District Areas

Davis Bayou. Under alternative 2, the expanded maintenance facility and dormitory could affect soils in localized areas, creating minor, long-term, adverse effects on soils. The replacement of impermeable pavement with permeable surfaces would help capture surface water runoff and have long-term, minor, beneficial effects on soils. The replacement of inadequate culverts with appropriately sized culverts or bridging structures would restore natural flows and have moderate, long-term, beneficial effects on soils.

Cat Island. Increased access would likely create an increase in visitor-created trails over dunes and other features—leading to soil compaction and erosion. Increased boating activity would increase shoreline erosion as a result of wave action. These increased activities would have minor, long-term, adverse effects on soils.

East and West Ship Islands. On West Ship, administrative vehicle use through dunes and tractor use of a road through a wetland would be discontinued, creating minor, long-term, beneficial effects on soils.

On East Ship Island, where camping occurs, campers use dead and down woody material

for campfires, preventing this organic material from returning to the soil and depleting soils of these critical nutrients. Implementing a permit system and teaching campers about the nutrient cycle and organic material as part of the permit process could lessen the impact of camping both in terms of firewood gathering and by improving dispersal of visitors compared to the no-action alternative; these actions would have minor, long-term, beneficial effects on soils.

On West Ship, overnight camping would be introduced as a new use, creating new minor, long-term, adverse effects on soils.

Application of the nonmotorized zone on both islands would restrict boat traffic and landings, benefitting shoreline marshes and fragile peat banks that are easily eroded by the wave action from boats. Impacts on soils would be moderate, long term, and beneficial. The reduction in the current development footprint following a destructive storm would have negligible to minor, long-term, beneficial effects on soils.

Horn and Petit Bois Islands. The anticipated impacts related to implementing a camping permit system and applying a nonmotorized zone would be similar to those described above for the Ship Islands.

Cumulative Impacts

Gravel and asphalt debris from road construction and maintenance that has accumulated over the long term would continue to have a moderate adverse effect on soils because these foreign materials are being integrated into the natural soil regimen and they affect the soil consistency, texture, and chemistry. All areas of the national seashore with a surfaced road are similarly affected by the accumulation of nonnative materials.

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on soil resources may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of oil collected. These impacts may be minor to moderate in intensity.

Unauthorized ORV use has been occurring between Pensacola Beach and Fort Pickens when the road is destroyed by storms, creating minor adverse effects on soils. Visitors walking off trails have created unauthorized trails over natural sand dunes. These conditions have exacerbated wind and water erosion and would likely continue to result in negligible to minor adverse effects on soils.

Overall, the combined effects of these past, present, and future actions would be adverse and minor in intensity.

The effects of other past, present and future actions, when combined with the long-term, minor and moderate, beneficial and long-term, minor, adverse impacts of actions proposed in alternative 2, would result in minor, adverse cumulative effects. Alternative 2 would make a modest, primarily beneficial, contribution to these impacts.

Conclusion

Implementing alternative 2 would result in long-term minor and moderate beneficial impacts and a long term minor adverse impact on national seashore soils. The overall cumulative effects would be adverse and minor in intensity.

IMPACTS OF IMPLEMENTING ALTERNATIVE 3

Florida District Areas

Naval Live Oaks. Under alternative 3, negligible, long-term, adverse effects on soils would occur because of campground use being expanded. Expansion of the maintenance complex would take place where the

entire soil surface is currently covered with gravel. Therefore, no changes in soil condition would occur within the maintenance complex.

The replacement of impermeable paved surfaces with permeable paved surfaces in parking areas would substantially reduce surface water runoff by capturing rainwater and permitting it to infiltrate back into the ground. This reduction in surface water runoff would decrease the rate of erosion in drainage channels and streambeds, resulting in long-term, minor, beneficial effects on soils.

Pensacola Naval Air Station Historic Sites. Clearing trees to open vistas near Fort Barrancas could locally increase soil erosion and runoff, creating negligible, short-term, adverse effects on soils. Short-term impacts would occur during thinning and for about 1 to 2 years after thinning operations based on the rate of vegetation reestablishment.

Perdido Key. Johnson Beach Road would be removed following a destructive storm, and a narrower multiuse trail would take its place—restoring the natural function and conditions of the part of the road that would not be used for the trail. The resulting impacts on soils would be negligible to minor, long term, and beneficial.

The proposed restroom facilities at the eastern tip of Perdido Key could affect soils in a localized area, having negligible to minor, long-term, adverse effects on soils.

Fort Pickens. There would be no change in the pre-Hurricane Ivan development footprint. Therefore there would be no new effects on soils.

Santa Rosa Island. There would be no change in the pre-Hurricane Ivan development footprint. Visitors would continue to walk off trail and create unauthorized trails over natural sand dunes. These activities exacerbate wind and water erosion and would continue to result in negligible to minor, long-term, adverse effects on soils.

Okaloosa. There would be no change in the pre-Hurricane Ivan development footprint. Therefore there would be no new effects on soils.

Mississippi District Areas

Davis Bayou. Under alternative 3, the expanded maintenance facility and administrative development and the construction of an amphitheatre and pavilion, could affect soils in localized areas—resulting in moderate, long-term, adverse effects on soils. The replacement of impermeable pavement with permeable surfaces would help capture surface water runoff and have long-term, minor, beneficial effects on soils. The replacement of inadequate culverts with appropriately sized culverts or bridging structures would restore natural flows and have moderate, long-term, beneficial effects on soils.

Cat Island. Increased access and the development of a group campsite with 10 to 15 tent pads would directly affect soils and likely create an increase in visitor-created trails over dunes and other features, which would lead to soil compaction and erosion. Increased boating activity would increase shoreline erosion as a result of wave action from boats. These increased activities would have minor to moderate, long-term, adverse effects on soils.

East and West Ship Islands. On West Ship, administrative vehicle use through dunes and use of a road through a wetland would be discontinued, creating minor, long-term, beneficial effects on soils.

On East Ship Island, where camping occurs, campers use dead and down woody material for campfires, preventing this organic material from returning to the soils and further depleting soils of these critical nutrients. Implementing a permit system and teaching campers about the nutrient cycle and organic material as part of the permit process could lessen the impact of camping both in terms of firewood gathering and by improving dispersal of

visitors compared to the no-action alternative; these actions would have minor, long-term, beneficial effects on soils.

On West Ship, overnight camping would be introduced as a new use, creating new minor, long-term adverse effects on soils.

If it becomes necessary because of adverse effects, application of the seagrass bed protection zone would restrict boat traffic and landings. Shoreline marshes and fragile peat banks that are easily eroded would benefit from this restriction, resulting in minor, long-term, beneficial effects on soils. Following a destructive storm, the current development footprint would be reconstructed, so there would be no change in the developed area footprint or new impacts on soils.

Horn and Petit Bois Islands. Under this alternative, impacts related to implementing a camping permit system and possibly applying a seagrass bed protection zone would be similar to those described for the Ship Islands.

Cumulative Impacts

Gravel and asphalt debris from road construction and maintenance that has accumulated over the long term would continue to have a moderate adverse effect on soils because these foreign materials are being integrated into the natural soil regimen and they affect the soil consistency, texture, and chemistry. All areas of the national seashore with a surfaced road are similarly affected by the accumulation of nonnative materials.

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on soil resources may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of oil collected. These impacts may be minor to moderate in intensity.

Unauthorized ORV use has been occurring between Pensacola Beach and Fort Pickens when the road is destroyed by storms, creating minor adverse effects on soils. Visitors walking off trails have created unauthorized trails over natural sand dunes. These conditions have exacerbated wind and water erosion and would likely continue to result in negligible to minor adverse effects on soils.

Overall, the combined effects of these past, present, and future actions would be adverse and minor in intensity.

The effects of other past, present and future actions, combined with the minor and moderate adverse and beneficial effects of actions proposed in alternative 3, would result in adverse, minor, cumulative effects. Alternative 3 would slightly reduce these overall adverse cumulative impacts.

Conclusion

Implementing alternative 3 would result in long-term minor and moderate adverse impacts and a long-term minor beneficial effect on national seashore soils. The overall cumulative effects would be adverse and minor in intensity.

IMPACTS OF IMPLEMENTING ALTERNATIVE 4

Florida District Areas

Naval Live Oaks. Under alternative 4, impacts on soils would be exacerbated by additional development, which would further cover and disrupt the natural soil horizons and soil function. However, expanded parking areas would use a permeable surface, reducing the impact on soils to minor, long term, and adverse.

Localized impacts on soils would occur as a result of primitive tent camping being expanded, the trail system being expanded, and the construction of a new paved trail; all

these actions would have minor, long term, adverse effects on soils.

The replacement of impermeable paved surfaces with permeable paved surfaces in parking areas would substantially reduce surface water runoff by capturing rainwater and permitting it to infiltrate back into the ground. This reduction in surface water runoff would decrease the rate of erosion in drainage channels and streambeds, resulting in long-term, minor, beneficial effects on soils.

Pensacola Naval Air Station Historic Sites. Clearing trees to open vistas near Fort Barrancas could locally increase soil erosion and runoff, creating negligible, short-term, adverse effects on soils. Short-term impacts would occur during thinning and for about 1 to 2 years after thinning operations based the rate of vegetation becoming reestablished.

Perdido Key. The proposed expanded development footprint at Johnson Beach and the eastern tip of Perdido Key could affect soils in localized areas based on proposed new facilities, a new 0.5-mile-long trail, and associated visitor activities. Impacts on soils would be minor, long term, and adverse.

Fort Pickens. There would be no change in the pre-Hurricane Ivan development footprint. Therefore, there would be no new effects on soils.

Santa Rosa Island. An expanded development footprint and increased visitor use would change soil character within a localized area. Impacts on soils would be minor, long term, and adverse.

Okaloosa. An expanded development footprint and increased visitor use would change soil character within a localized area. Impacts on soils would be negligible to minor, long term, and adverse.

Mississippi District Areas

Davis Bayou. Under alternative 4, the expanded maintenance facility and administrative development and the construction of a dormitory, amphitheatre, pavilion, and bayou boathouse could affect soils in localized areas—resulting in moderate, long-term, adverse effects on soils. The construction of a multiuse trail would adversely affect soils both from physical placement of this trail and from runoff that would cause erosion. Impacts on soils would be moderate, long term, and adverse. The replacement of impermeable pavement with permeable surfaces would help capture surface water runoff and have long-term, minor, beneficial effects on soils. The replacement of inadequate culverts with appropriately sized culverts or bridging structures would restore natural flows and have moderate, long-term, beneficial effects on soils.

Cat Island. Increased access would directly affect soils and likely create an increase in visitor-created trails over dunes and other features, leading to soil compaction and erosion. Increased boating activity would increase shoreline erosion as a result of wave action from boats. The development and construction of a small, primitive campground and a bunkhouse and research facility with a classroom and laboratory would affect soils in localized areas. These increased activities and new development would have minor to moderate, long-term, adverse effects on soils.

East and West Ship Islands. On West Ship, administrative vehicle use through dunes and use of a road through a wetland would be discontinued, creating minor, long-term, beneficial effects on soils.

On East Ship Island, where camping occurs, campers use dead and down woody material for campfires, preventing this organic material from returning to the soil and further depleting soils of these critical nutrients. Implementing a permit system and teaching campers about the nutrient cycle and organic material as part of the permit process could lessen the impact of camping both in terms of firewood gathering and by improving dispersal of visitors compared to the no-action alternative. Impacts on soils would be minor, long term, and beneficial.

On West Ship, overnight camping would be introduced as a new use. Impacts on soils would be minor, long term and adverse.

If impacts on seagrass beds become too severe, application of the seagrass bed protection zone would restrict boat traffic and landings. Shoreline marshes and fragile peat banks that are easily eroded would benefit, and impacts on soils would be minor, long term, and beneficial. Following a destructive storm, the current development footprint would be reconstructed, representing no change in the developed area footprint or new impacts on soils.

On West Ship Island, the diverse visitor opportunities zone would overlie areas capable of absorbing a diverse range of outdoor recreation and interpretive visitor opportunities intermixed within both natural and developed environments. If developed, picnic shelters, pavilions, restrooms, restaurants or other visitor amenities would increase the development footprint. These activities and development would have moderate, long-term, adverse effects on soils.

Horn and Petit Bois Islands. Impacts related to instituting a camping permit system and boater access would be the same as described above for the Ship Islands.

The current development footprint and administrative activity on Horn Island would remain and following a destructive storm would be reconstructed. Thus negligible, long-term, adverse effects on soils would continue.

Cumulative Impacts

Gravel and asphalt debris from road construction and maintenance that has accumulated over the long term would continue to have a moderate adverse effect on soils because these foreign materials are being integrated into the natural soil regimen and they affect the soil consistency, texture, and chemistry. All areas of the national seashore with a surfaced road are similarly affected by the accumulation of nonnative materials.

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on soil resources may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of oil collected. These impacts may be minor to moderate in intensity.

Unauthorized ORV use has been occurring between Pensacola Beach and Fort Pickens when the road is destroyed by storms, creating minor adverse effects on soils. Visitors walking off trails have created unauthorized trails over natural sand dunes. These conditions have exacerbated wind and water erosion and would likely continue to result in negligible to minor adverse effects on soils.

Overall, the combined effects of these past, present, and future actions would be adverse and minor in intensity.

The effects of other past, present, and future actions, combined with the long-term, minor and moderate, adverse effects and a long-term minor beneficial effect of actions proposed in alternative 4, would result in minor adverse cumulative impacts. Alternative 4 would modestly contribute to these adverse cumulative impacts.

Conclusion

Implementing alternative 4 would result in long-term, minor and moderate, adverse impacts and a long-term minor to moderate beneficial effect on national seashore soils. The overall cumulative effects would be adverse and minor in intensity.

IMPACTS ON WATER QUALITY

METHODS AND ASSUMPTIONS FOR ANALYZING IMPACTS

Water quality is analyzed in this section. The following impact thresholds have been developed for analysis. Water quality standards are set and monitored by the Florida Department of Environmental Protection and the Mississippi Department of Environmental Quality in the Florida and Mississippi districts, respectively.

Negligible: Impacts (from chemical, physical, or biological sources) would not be detectable, would be well below water quality standards or criteria, and would be within historical or desired water quality conditions.

Minor: Impacts (chemical, physical, or biological) would be detectable but would be below water quality standards or criteria and within historical or desired water quality conditions.

Moderate: Impacts (chemical, physical, or biological) would be detectable but would be at or below water quality standards or criteria; however, historical baseline or desired water quality conditions would be temporarily altered.

Major: Impacts (chemical, physical, or biological) would be detectable and would be frequently altered from the historical baseline or desired water quality conditions, and/or chemical, physical, or biological water quality standards or criteria would temporarily be exceeded.

IMPACTS OF IMPLEMENTING ALTERNATIVE 1

Florida District Areas

Naval Live Oaks. Under the no-action alternative, there would be no effect at this national seashore area.

Pensacola Naval Air Station Historic Sites. There would be no change in the pre-Hurricane Ivan development footprint or NPS activities; current negligible effects on water quality would continue.

Perdido Key. Unrestricted boat and land use at the eastern tip of the island adjacent to Fort McRee would continue, perpetuating the current problems. The lack of restrooms available for visitors to use would continue to have minor to moderate short- and long-term adverse effects on water quality.

Fort Pickens. Wastewater generated at Fort Pickens is handled by pumping it through a sanitary transmission pipeline to Pensacola Beach to be treated by the municipal water treatment facility. If a storm breaks the pipeline or washes it away, limited untreated wastewater would be released into the environment, resulting in minor, short-term, adverse effects on water quality.

Santa Rosa Island. Wastewater generated at Opal Beach is pumped through a sanitary transmission pipeline to Navarre Beach to be treated by the municipal water treatment facility. If a storm breaks the pipeline and/or washes it away, limited untreated wastewater would be released into the environment, creating direct and indirect, minor, short-term, adverse effects on water quality.

Okaloosa. There would be no change in the pre-Hurricane Ivan development footprint. There would be no new effects.

Mississippi District Areas

Davis Bayou. Under the no-action alternative, impermeable surfaces would continue to accelerate surface water sheet flow and inappropriately sized culverts would continue to channelize flow in drainage basins. These conditions escalate runoff of stormwater into adjacent waters, thereby increasing soil

erosion and turbidity, and negligible to minor adverse effects on water quality would continue.

Cat Island. There would be no change in the existing development footprint. Therefore, there would be no new effects.

East and West Ship Islands. There would be no change in the pre-Hurricane Ivan development footprint. On West Ship Island, wastewater treatment is provided by a septic tank and elevated leach mound. Because of the sandy nature of the island soils and relatively high water table, this type of sanitary system results in negligible, long-term, adverse effects on water quality. Because East Ship Island does not provide toilet facilities, visitors are required to either pack out human waste or use cat holes to bury waste. The use of cat holes in various locations across the island presents sanitation issues and creates negligible, long-term, adverse effects on water quality.

On West Ship Island, the use of well water for toilets and showers creates water table draw down and increases saltwater intrusion into the aquifer. Showers use at least 60% of the freshwater that is pumped from the aquifer at this location. These conditions present a risk of minor to moderate, long-term, adverse effects on groundwater quality.

An abandoned open well on West Ship Island presents a potential risk of groundwater contamination. The open vertical column at the ground surface provides a direct conduit to the aquifer below and allows salt water or polluted surface water to flow through the entire depth of the well. In an unplugged well, each of these issues creates the potential for moderate, long-term adverse effects on groundwater quality from contamination by chemicals, pathogens, or saltwater.

Horn and Petit Bois Islands. There would be no change in the pre-Hurricane Ivan development footprint of the administrative facility on Horn Island. Wastewater treatment for this facility is provided by septic tank and elevated leach mound. Because of the sandy nature of the island soils and relatively high water table, this type of sanitary system results in negligible, long-term, adverse effects on water quality. Because Horn and Petit Bois Islands are both designated wilderness, no toilet facilities are provided and visitors are required to either pack out human waste or use cat holes to bury waste. The use of cat holes in various locations across both islands presents sanitation issues and continues to have negligible, long-term, adverse effects on water quality.

Two abandoned wells on West Ship Island present a potential risk of groundwater contamination. The open vertical columns at the ground surface provide direct conduits to the aquifer below and allow salt water or polluted surface water to flow through the entire depth of either well. In unplugged wells, each of these issues creates the potential for moderate, long-term, adverse effects on groundwater quality from contamination by chemicals, pathogens, or saltwater.

Cumulative Impacts

Water quality in the national seashore has been adversely impacted by numerous nonpoint and point source pollution. Nonpoint sources include urban stormwater runoff, agricultural runoff, spills from marinas and general boat traffic, and seepage of contaminated groundwater into surface waters. Point sources on the mainland include effluent from sewer outlets, a chemical plant, a paper mill, the American Creosote Works superfund site, and others. These activities have caused and continue to cause long-term moderate, adverse, impacts on water quality.

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on water resources may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of

oil collected. These impacts may be minor to moderate in intensity.

Within the national seashore, ongoing degradation to water quality from petrochemicals in stormwater runoff of roads and parking areas occurs where these features are provided. Negligible to minor long-term adverse effects in the form of nonpoint source pollution would continue.

Overall, the combined effects of these past, present, and future actions would be adverse and moderate in intensity.

The effects of other past, present and future actions, combined with the negligible to moderate adverse effects of implementing the no-action alternative, would be moderate, adverse, cumulative effects. Alternative 1 would contribute modestly to these adverse cumulative effects.

Conclusion

Implementing the no-action alternative would continue long-term negligible to moderate adverse impacts on water quality. The overall cumulative effects would be adverse and moderate in intensity.

IMPACTS OF IMPLEMENTING ALTERNATIVE 2

Florida District Areas

Naval Live Oaks. Under alternative 2, the replacement of impermeable pavement with permeable surfaces would increase filtering of petrochemicals through soil and would help capture surface water runoff. This would likely improve water quality over the short term and could potentially improve water quality in the long term, resulting in negligible to minor, beneficial effects on water quality. The use of best management practices for stormwater management during construction (an erosion and sedimentation control plan) and as part of the overall design of facilities would help prevent further water quality degradation from erosion and sedimentation.

Pensacola Naval Air Station Historic Sites. There would be no change in the pre-Hurricane Ivan development footprint or NPS activities. Therefore, there would be no new effects.

Perdido Key. Use at eastern end of island adjacent to Fort McRee would be regulated, possibly limiting the number of visitors to this location and providing an opportunity for those visitors to be educated about health, hygiene, and sanitation. Although regulation and education would be provided under this alternative, reducing the overall impact on water quality from baseline conditions, no toilet facilities would be provided and impacts on water quality would be negligible to minor, short and long term, and adverse.

Fort Pickens. If the road is washed out and not replaced following a storm, visitation and associated toilet use would likely be lower than pre-Hurricane Ivan conditions. The projected decrease in wastewater flow would allow the pipeline to Pensacola Beach to be removed and replaced with a sustainable wastewater treatment system and/or facility near Fort Pickens. If a storm destroys or washes away this on-site system, untreated wastewater would be released into the environment resulting in minor, short-term, adverse effects on water quality.

Without the road to Fort Pickens, automobile use on this island would be nearly eliminated and fewer petrochemicals would be introduced into surface and groundwater flows, resulting in minor, long-term, beneficial effects on water quality.

Santa Rosa Island. If the road is washed out and replaced with an emergency one-lane road following a storm, visitor facilities would be relocated from Opal Beach to the eastern and western entry areas within NPS lands closer to the bordering communities of Navarre Beach and Pensacola Beach. Automobile use on this island would be greatly reduced by these actions, and fewer

petrochemicals would be introduced into surface and groundwater flows resulting in minor, long-term, beneficial effects on water quality.

Toilets would be provided, and wastewater would be conveyed by pipeline to the adjacent communities to be treated. Because the overall sanitary transmission pipeline distance would be reduced, there would be a reduced risk for pipeline washout during storms. If a storm destroyed or washed away these pipelines, limited untreated wastewater would be released into the environment, creating minor, short-term, adverse effects on water quality.

Okaloosa. There would be no change in the pre-Hurricane Ivan development footprint. Therefore, there would be no new impacts.

Mississippi District Areas

Davis Bayou. Under alternative 2, the replacement of impermeable pavement with permeable surfaces would increase filtering of petrochemicals through soil and would help capture surface water runoff. This would likely improve water quality over the short term and could potentially improve water quality in the long term. Beneficial effects on water quality would be minor to moderate. The replacement of inadequate culverts with appropriately sized culverts or bridging structures would restore natural flows and would result in moderate, long-term, beneficial effects on water quality. The use of best management practices for stormwater management during construction (an erosion and sedimentation control plan) and as part of the overall design of facilities would help prevent further water quality degradation from erosion and sedimentation.

The conversion of the public boat launch to a canoe dock would decrease use at this launch site and also remove motorized boat use from this site. Beneficial effects on water quality would be moderate and long term.

Cat Island. Infrastructure improvements would likely be minimal and accommodate proposed activities. However, increased boat use would mean more visitors and would introduce additional petrochemicals into the immediate environment. Increased visitation throughout the island would also create additional sanitation issues. All of these new actions would have negligible to minor, long-term, adverse effects on water quality.

East and West Ship Islands. On West Ship Island, there would be a reduction in the current development footprint following a destructive storm. Showers would not be replaced, and flush toilets would be replaced with another toilet system such as composting or vault toilets. These changes would eliminate the need for well water that services these fixtures and would also include the removal and/or abandonment of the septic tank and elevated leach mound system. These proposed changes would have minor to moderate, long-term, beneficial effects on water quality. Visitors to East Ship Island would continue to be required to either pack out human waste or use cat holes to bury waste. The use of cat holes in various locations across the island would continue to present sanitation issues and continue to have negligible long-term adverse effects on water quality.

The abandoned open well on West Ship Island would be filled and capped, and the well casing would likely be removed to eliminate the risk of groundwater or saltwater contamination. The plugging of this well shaft in the long term would have moderate beneficial effects on groundwater quality. The removal and capping of the well would temporarily disturb groundwater and result in moderate adverse effects on water quality during and immediately following removal.

Horn and Petit Bois Islands. There would be similar effects as those described for the Ship islands (except those described for the showers) under this alternative.

Cumulative Impacts

Water quality in the national seashore has been adversely impacted by numerous

nonpoint and point source pollution. Nonpoint sources include urban stormwater runoff, agricultural runoff, spills from marinas and general boat traffic, and seepage of contaminated groundwater into surface waters. Point sources on the mainland include effluent from sewer outlets, a chemical plant, a paper mill, the American Creosote Works superfund site, and others. These activities have caused and continue to cause long-term moderate, adverse, impacts on water quality.

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on water resources may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of oil collected. These impacts may be minor to moderate in intensity.

Within the national seashore, ongoing degradation to water quality from petrochemicals in stormwater runoff of roads and parking areas occurs where these features are provided. Negligible to minor long-term adverse effects in the form of nonpoint source pollution would continue.

Overall, the combined effects of these past, present, and future actions would be adverse and moderate in intensity.

The effects of other past, present and future actions, combined with the long-term minor and moderate adverse impacts and minor to moderate beneficial impacts of implementing alternative 2, would be moderate adverse cumulative effects. Alternative 2 would slightly reduce these adverse impacts by contributing beneficial effects in some areas.

Conclusion

Implementing alternative 2 would result in long-term minor and moderate adverse impacts and minor to moderate beneficial impacts on water quality. The overall cumulative effects would be adverse and moderate in intensity.

IMPACTS OF IMPLEMENTING ALTERNATIVE 3

Florida District Areas

Naval Live Oaks. Under alternative 3, the replacement of impermeable pavement with permeable surfaces would increase filtering of petrochemicals through soil and would help capture surface water runoff. This would likely improve water quality over the short term and could potentially improve water quality in the long term, resulting in negligible to minor, beneficial effects on water quality. The use of best management practices for stormwater management during construction (an erosion and sedimentation control plan) and as part of the overall design of facilities would help prevent further water quality degradation from erosion and sedimentation.

Pensacola Naval Air Station Historic Sites. The clearing of trees by the National Park Service to open vistas near Fort Barrancas could locally increase soil erosion and runoff into adjacent waters. This could increase turbidity in the short term and have negligible to minor, adverse effects on water quality. Short-term impacts would occur during thinning and for about 1 to 2 years after thinning operations based on the rate of vegetation reestablishment.

Perdido Key. Use at eastern end of island adjacent to Fort McRee would be regulated, possibly limiting the number of visitors to this location and providing an opportunity for those visitors to be educated about health, hygiene and sanitation. Toilet facilities would be provided, further improving the situation. Beneficial impacts on water quality would be minor to moderate and short and long term.

Fort Pickens. Wastewater generated at Fort Pickens is pumped through a pipeline to Pensacola Beach to be treated by the municipal water treatment facility. If a storm breaks

the pipeline and/or washes it away, limited untreated wastewater would be released into the environment, creating minor, short-term, adverse effects on water quality.

Santa Rosa Island. The anticipated impacts of alternative 3 are similar to those described for Fort Pickens.

Okaloosa. There would be no change in the pre-Hurricane Ivan development footprint. Therefore, there would be no new impacts on water quality.

Mississippi District Areas

Davis Bayou. Under alternative 3, the replacement of impermeable pavement with permeable surfaces would increase filtering of petrochemicals through soil and would help capture surface water runoff. This would likely improve water quality over the short term and could potentially improve water quality in the long term. Beneficial effects on water quality would be minor to moderate. The replacement of inadequate culverts with appropriately sized culverts or bridging structures would restore natural flows and would result in moderate, long-term, beneficial effects on water quality. The use of best management practices for stormwater management during construction (an erosion and sedimentation control plan) and as part of the overall design of facilities would help prevent further water quality degradation from erosion and sedimentation.

Cat Island. Infrastructure improvements would likely be minimal and accommodate proposed activities. However, increased boat use would mean more visitors and would introduce additional petrochemicals into the immediate environment. Increased visitation throughout the island would also create additional sanitation issues. All of these new actions would have negligible to minor, long-term, adverse effects on water quality.

East and West Ship Islands. There would be no change in the pre-Hurricane Ivan development footprint. Following a destructive storm, all facilities would be reconstructed. The use of well water for toilets and showers on West Ship Island would continue to create water table draw down, increasing saltwater intrusion into the groundwater aquifer. Showers use at least 60% of the freshwater that is pumped from this aquifer. Wastewater treatment would continue to be provided by a septic tank and elevated leach mound. Because visitation is anticipated to increase under this alternative, the associated use of well water and wastewater generated are both expected to increase, having minor to moderate, long-term, adverse effects on water quality.

Visitors on East Ship Island would continue to be required to either pack out human waste or use cat holes to bury waste. The use of cat holes in various locations across the island would continue to present sanitation issues and have negligible, long-term, adverse effects on water quality.

The abandoned well on West Ship Island would be filled and capped, and the well casing would likely be removed to eliminate the risk of groundwater or saltwater contamination. The plugging of this well shaft in the long term would have moderate beneficial effects on groundwater quality. The removal and capping of well would temporarily disturb groundwater and result in moderate adverse effects on water quality during and immediately following removal.

Horn and Petit Bois Islands. The anticipated impacts of this alternative are similar to those described for the Ship islands except for those described for the showers.

Cumulative Impacts

Water quality in the national seashore has been adversely impacted by numerous nonpoint and point source pollution. Nonpoint sources include urban stormwater runoff, agricultural runoff, spills from marinas and general boat traffic, and seepage of contaminated groundwater into surface waters. Point sources on the mainland include effluent from

sewer outlets, a chemical plant, a paper mill, the American Creosote Works superfund site, and others. These activities have caused and continue to cause long-term moderate, adverse, impacts on water quality.

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on water resources may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of oil collected. These impacts may be minor to moderate in intensity.

Within the national seashore, ongoing degradation to water quality from petrochemicals in stormwater runoff of roads and parking areas occurs where these features are provided. Negligible to minor long-term adverse effects in the form of nonpoint source pollution would continue.

Overall, the combined effects of these past, present, and future actions would be adverse and moderate in intensity.

The effects of other past, present and future actions, in combination with the long-term minor and moderate adverse impacts and a minor to moderate beneficial impact of alternative 3, would result in adverse, moderate, cumulative impacts. Alternative 3 would provide a small adverse contribution to these cumulative impacts.

Conclusion

Implementing alternative 3 would result in long-term minor and moderate adverse impacts and a minor to moderate beneficial impact on water quality. The overall cumulative effects would be adverse and moderate in intensity.

IMPACTS OF IMPLEMENTING ALTERNATIVE 4

Florida District Areas

Naval Live Oaks. Under alternative 4, the replacement of impermeable pavement with permeable surfaces would increase filtering of petrochemicals through soil and would help capture surface water runoff. This would likely improve water quality over the short term and could potentially improve water quality in the long term, resulting in negligible to minor, beneficial effects on water quality. The use of best management practices for stormwater management during construction (an erosion and sedimentation control plan) and as part of the overall design of facilities would help prevent further water quality degradation from erosion and sedimentation.

Pensacola Naval Air Station Historic Sites. The clearing of trees by the National Park Service to open vistas near Fort Barrancas could locally increase soil erosion and runoff into adjacent waters. This could increase turbidity in the short term and have negligible to minor, adverse effects on water quality. Short-term impacts would occur during thinning and for about 1 to 2 years after thinning operations based on the rate that vegetation becomes reestablished.

Perdido Key. Use at eastern end of island adjacent to Fort McRee would be regulated, possibly limiting the number of visitors to this location and providing an opportunity for those visitors to be educated about health, hygiene, and sanitation. Toilet facilities would be provided, further improving the situation. Minor to moderate, short-and long-term beneficial effects on water quality would result.

Fort Pickens. Wastewater generated at Fort Pickens is pumped through a pipeline to Pensacola Beach to be treated by the municipal water treatment facility. If a storm breaks the pipeline or washes it away, limited untreated wastewater would be released into the environment and have minor, short-term, adverse effects on water quality.

Santa Rosa Island. Anticipated impacts under alternative 4 would be similar to those described for Fort Pickens.

Okaloosa. An expanded boat launch facility, with capacity for larger boats and more frequent boat use, and the construction of additional parking spaces would increase visitor use and would contribute additional pollutants above the baseline conditions. Degradation of water quality from petrochemicals from motorized vessel launchings and stormwater runoff from additional parking areas and an associated increase in automobile traffic would have negligible to minor, long-term, adverse effects on water quality.

Mississippi District Areas

Davis Bayou. Under alternative 4, the replacement of impermeable pavement with permeable surfaces would increase filtering of petrochemicals through soil and would help capture surface water runoff. This would likely improve water quality over the short term and could potentially improve water quality in the long term. Beneficial effects on water quality would be minor to moderate. The replacement of inadequate culverts with appropriately sized culverts or bridging structures would restore natural flows and would result in moderate, long-term, beneficial effects on water quality. The use of best management practices for stormwater management during construction (an erosion and sedimentation control plan) and as part of the overall design of facilities would help prevent further water quality degradation from erosion and sedimentation.

Dredging operations to keep the bayou accessible to larger boats would have moderate, long-term, adverse effects on water quality.

Cat Island. Infrastructure improvements would accommodate proposed activities. However, visitation would be greatest in alternative 4 compared to any other alternative. Increased boat use would introduce additional petrochemicals into the immediate environment. Increased visitation throughout the island (with no toilet facilities) would result in additional sanitation issues. All of these new actions would have minor, long-term, adverse effects on water quality.

East and West Ship Islands. There would be no change in the pre-Hurricane Ivan development footprint. Following a destructive storm, all facilities would be reconstructed. The use of well water for toilets and showers on West Ship Island would continue to create water table draw down, increasing saltwater intrusion into the groundwater aquifer. Showers use at least 60% of the freshwater that is pumped from this aquifer. Wastewater treatment would continue to be provided by a septic tank and elevated leach mound. Because visitation is anticipated to increase under this alternative, the associated use of well water and wastewater generated are both expected to increase, having minor to moderate, long-term, adverse effects on water quality.

Visitors on East Ship Island would continue to be required to either pack out human waste or use cat holes to bury waste. The use of cat holes in various locations across the island would continue to present sanitation issues and have negligible, long-term, adverse effects on water quality.

The abandoned well on West Ship Island would be filled and capped, and the well casing would likely be removed to eliminate the risk of groundwater or saltwater contamination. The plugging of this well shaft in the long term would have moderate beneficial effects on groundwater quality. The removal and capping of well would temporarily disturb groundwater and result in moderate adverse effects on water quality during and immediately following removal.

Horn and Petit Bois Islands. Anticipated impacts from alternative 4 would be similar to those described for the Ship islands except for those described for the showers.

Cumulative Impacts

Water quality in the national seashore has been adversely impacted by numerous nonpoint and point source pollution. Nonpoint sources include urban stormwater runoff, agricultural runoff, spills from marinas and general boat traffic, and seepage of contaminated groundwater into surface waters. Point sources on the mainland include effluent from sewer outlets, a chemical plant, a paper mill, the American Creosote Works superfund site, and others. These activities have caused and continue to cause long-term moderate, adverse, impacts on water quality.

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on water resources may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of oil collected. These impacts may be minor to moderate in intensity.

Within the national seashore, ongoing degradation to water quality from petrochemicals in stormwater runoff of roads and parking areas occurs where these features are provided. Negligible to minor long-term adverse effects in the form of nonpoint source pollution would continue.

Overall, the combined effects of these past, present, and future actions would be adverse and moderate in intensity.

The effects of other past, present, and future actions, combined with the long-term minor and moderate adverse impacts and a minor to moderate beneficial impact of alternative 4, would be moderate adverse cumulative impacts. Alternative 4 would provide a small adverse contribution to these cumulative impacts.

Conclusion

Implementing alternative 4 would result in long-term minor and moderate adverse impacts and a minor to moderate beneficial impact on water quality. The overall cumulative effects would be adverse and moderate in intensity.

IMPACTS ON WETLANDS

METHODS AND ASSUMPTIONS FOR ANALYZING IMPACTS

Wetlands and riparian areas are analyzed together in this section. Only those national seashore areas where wetlands occur or where they would be affected are included. The following impact thresholds have been developed for analysis.

Negligible: No measurable or perceptible changes in wetland size, integrity, or continuity would occur.

Minor: The impact would be measurable or perceptible, but slight. A small change in size, integrity, or continuity could occur due to short-term indirect effects such as construction-related runoff.

Moderate: The impact would be sufficient to cause a measurable change in the size, integrity, or continuity of the wetland — including native species diversity, soil structure, hydrology or primary functions and values—or would result in a small loss or gain in wetland acreage.

Major: The action would result in a measurable change in all three parameters (size, integrity, and continuity). The impact would be substantial and highly noticeable. Adverse impact: Wetland would be filled or obliterated. Beneficial impact: Wetland would be restored to proper functioning condition.

IMPACTS OF IMPLEMENTING ALTERNATIVE 1

Florida District Areas

Naval Live Oaks. Existing activities currently do not occur within wetland areas at Naval Live Oaks. Under the no-action alternative, there would be no change in the pre-Hurricane Ivan development footprint and there would be no new effect.

Fort Pickens. Under the no-action alternative, the road from Pensacola Beach to Fort Pickens would be reconstructed if damaged by a storm. The 2004 and 2005 storms created new wetlands in the breach area between these two locations. Because of the dynamic nature of this coastal environment, and because the road remains in a fixed location, the road now impacts these new wetlands. The existence and maintenance of the road within and adjacent to these wetlands continues to cause minor to moderate, long-term, adverse effects on wetlands.

Santa Rosa Island. Existing activities currently do not occur within wetland areas on Santa Rosa Island. There would be no change in the pre-Hurricane Ivan development footprint, and there would be no new effect.

Mississippi District Areas

Davis Bayou. By constricting the natural flow of streams and drainages, the combination of elevated roadways and inadequate culverts would continue to create a barrier that causes unnatural ponding in the swamps and marshes on the upstream side and scouring/channelization on the downstream or outlet side of the culvert. This blockage of natural water flow combined with the concentrated scouring action creates sedimentation and erosion that disrupts the natural processes. The impacts would continue to have long term, moderate, and adverse. Sheet flow from parking areas and other impermeable surfaces creates additional sedimentation and contamination. These conditions continue to have long-term, moderate, adverse impacts on wetlands.

Cat Island. There would be no change in the pre-Hurricane Ivan development footprint on Cat Island, which primarily consists of elevated roadways and ditched lowlands. Wetlands are currently impacted because of previous diking of swales and wetlands in attempts to drain wet areas and from

constructed walkways across others that block the natural flow and drainage. This disruption to the natural processes on Cat Island creates continuing moderate, long-term, adverse effects on wetlands.

East and West Ship Islands. Impacts on wetlands resulting from current operations on West Ship Island would continue. Current operations include the use of tractor paths to the well and the potential lowering of the water table because of well water draw down to provide water service for showers and toilets. Daily operations and routine maintenance of the NPS structures require these activities. All of these activities have moderate, long-term, adverse effects on wetlands.

Horn and Petit Bois Islands. The tractor path from the NPS pier to the compound (across the coastal marsh on the east side of Ranger Lagoon) on Horn Island that is used to move supplies and equipment to support area operations would continue to be used and maintained. Use and maintenance of the path have meant that wetland soils have been compacted over time. Berms have also been constructed on either side of the path to prevent flooding. Consequently, the east-west surface sheet flow of water across the marsh is interrupted, and runoff from the south becomes more channelized than would exist under natural conditions. The path bisects the greater marsh area, completely isolating the east marsh from Ranger Lagoon and its outlet to the Mississippi Sound except during floods. These disruptions to the natural processes on Horn Island continue to have moderate, long-term, adverse effects on wetlands.

Cumulative Impacts

Wetlands have been and are being moderately adversely impacted from damming or diking of swales and wetlands in attempts to drain wet areas, and from walkways constructed across other wetland areas that block the natural flow and drainage.

The National Park Service has a "no net loss of wetlands" policy, meaning that at least 1 acre of wetlands will be restored for each acre destroyed or degraded. Best management practices, such as stormwater detention basins or other such structures, are used to protect wetlands and other resources. Continuing to implement these practices would result in minor to moderate, beneficial impacts.

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on wetlands may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of oil collected. These impacts may be minor to moderate in intensity.

Overall, the combined effects of these past, present, and future actions would be adverse and moderate in intensity.

The effects of other past, present and future actions, combined with long-term, moderate, adverse impacts the effects of the no-action alternative, result in moderate adverse cumulative impacts on wetlands. Alternative 1 would make a small contribution to these adverse cumulative impacts.

Conclusion

Implementing the no-action alternative would continue long-term, moderate, adverse impacts on wetlands in the national seashore. The overall cumulative effects would be adverse and moderate in intensity.

IMPACTS OF IMPLEMENTING ALTERNATIVE 2

Florida District Areas

Naval Live Oaks. Under alternative 2, no development or activities are proposed within or adjacent to wetland areas in Naval Live

Oaks. Therefore, there would be no new effects.

Fort Pickens. If the road is washed out following a storm, it would not be replaced. Removing the road would permit the quality of wetlands and function of natural processes to be restored. The effects of this action would constitute an overall improvement and would have moderate, long-term, beneficial effects on wetlands.

Santa Rosa Island. No development or activities are proposed within or adjacent to wetland areas on Santa Rosa Island under alternative 2, so there would be no new effects.

Mississippi District Areas

Davis Bayou. Under alternative 2, inadequate culverts would be replaced with appropriately sized culverts or bridging structures that would restore natural flows, including tidal flow and fluctuation and storm surge. The replacement of impermeable pavement with permeable surfaces would help capture surface water runoff and reduce sheet flow into adjacent wetlands. These actions would have minor, short-term, adverse effects on wetlands during and immediately following construction activity and have moderate beneficial effects on wetlands in Davis Bayou over the long term.

Cat Island. A comprehensive wetland restoration effort would be made to restore natural processes via wetland restoration, including possible filling of dikes that block the natural flow of water. This restoration effort would have minor, short-term, adverse effects on wetlands during and immediately following construction activity and minor to moderate beneficial effects on wetlands in the long term.

East and West Ship Islands. On West Ship Island, mowing operations and tractor use through the wetland would be discontinued. Because shower and toilet facilities would be removed, the demand for fresh well water would be greatly reduced. All of these actions would have moderate, long-term, beneficial effects on wetlands.

The removal of an abandoned well would temporarily disturb wetlands, creating moderate, short-term, adverse effects.

Horn and Petit Bois Islands. Following the removal of administrative facilities on Horn Island, tractor use through the wetland would be discontinued. The tractor path would be restored to natural conditions, including the removal of berms and ditches, to return natural surface water flow through the marsh. All previously impacted areas would be replanted with native wetland vegetation. All of these actions would have moderate, long-term, beneficial effects on wetlands.

Cumulative Impacts

Past damming or diking of swales and wetlands to drain wet areas and walkways that were constructed across other wetland areas have continued to block the natural flow and drainage. Impacts continue to be moderate and adverse.

The National Park Service has a “no net loss of wetlands” policy, meaning that at least 1 acre of wetlands will be restored for each acre destroyed or degraded. Best management practices, such as storm water detention basins or other such structures, are used to protect wetlands and other resources. Continuing to implement these practices would result in minor to moderate, beneficial impacts.

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on wetlands may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of

oil collected. These impacts may be minor to moderate in intensity.

Overall, the combined effects of these past, present, and future actions would be adverse and minor in intensity.

The effects of other past, present and future actions, combined with the long-term, minor and moderate, beneficial impacts of alternative 2, would result in minor adverse cumulative impacts. Alternative 2 would contribute a modest beneficial impact to reduce the overall cumulative impacts.

Conclusion

Implementing alternative 2 would have long-term, minor and moderate, beneficial impacts on wetlands. The overall cumulative effects would be adverse and minor in intensity.

IMPACTS OF IMPLEMENTING ALTERNATIVE 3

Florida District Areas

Naval Live Oaks. No development or activities are proposed within or adjacent to wetland areas in Naval Live Oaks. Therefore alternative 3 would have no new effects on wetlands.

Fort Pickens. Under alternative 3, if the road is washed out following a storm, it would be replaced if feasible, continuing to impact wetlands in the breech area. Any future construction or repair work related to this road would continue to cause minor to moderate, long-term, adverse effects on wetlands.

Santa Rosa Island. No development or activities are proposed within or adjacent to wetland areas on Santa Rosa Island. Therefore alternative 3 would have no new effect on wetlands.

Mississippi District Areas

Davis Bayou. Under alternative 3, inadequate culverts would be replaced with appropriately sized culverts or bridging structures that would restore natural flows, including tidal flow and fluctuation and storm surge. The replacement of impermeable pavement with permeable surfaces would help capture surface water runoff and reduce sheet flow into adjacent wetlands. These actions would have minor, short-term, adverse effects on wetlands during and immediately following construction activity and moderate, beneficial effects on wetlands in Davis Bayou over the long term.

Cat Island. A comprehensive wetland restoration effort would be made to restore natural processes via wetland restoration, including possible filling of dikes that block the natural flow of water. This restoration effort would have minor short term adverse effects on wetlands during and immediately following construction activity and minor to moderate beneficial effects on wetlands in the long term.

East and West Ship Islands. On West Ship Island, tractor use through the wetland would be discontinued, resulting in moderate long-term beneficial effects.

The potential lowering of the water table to provide water for showers and toilets would continue to have moderate long-term adverse effects on wetlands because visitation levels and associated demand on groundwater would likely remain the same under this alternative as that in the no-action alternative.

The removal of an abandoned well would temporarily disturb wetlands, creating moderate, short-term, adverse effects.

Horn and Petit Bois Islands. Administrative facilities on Horn Island would not be removed, but tractor use through the wetland would be discontinued. The tractor path through the wetland would be replaced with a boardwalk, and utility lines would be suspended beneath the structure. With the

exception of the boardwalk, all disturbed areas would be restored to natural conditions, and berms and ditches would be removed to return natural surface water sheet flow through the marsh. All previously impacted areas would be replanted with native wetland vegetation. All of these actions would result in minor to moderate, long-term, beneficial effects on wetlands.

Cumulative Impacts

Past damming or diking of swales and wetlands to drain wet areas and walkways that were constructed across other wetland areas have continued to block the natural flow and drainage. Impacts continue to be moderate and adverse.

The National Park Service has a "no net loss of wetlands" policy, meaning that at least 1 acre of wetlands will be restored for each acre destroyed or degraded. Best management practices, such as storm water detention basins or other such structures, are used to protect wetlands and other resources. Continuing to implement these practices would result in minor to moderate, beneficial impacts.

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on wetlands may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of oil collected. These impacts may be minor to moderate in intensity.

Overall, the combined effects of these past, present, and future actions would be adverse and minor in intensity.

The primarily adverse effects of other past, present and future actions, combined with the long-term, moderate, beneficial impacts and the continuation of long-term, moderate, adverse impacts from actions proposed in alternative 3, would result in minor adverse cumulative impacts. Alternative 3 would comprise a small contribution of beneficial and adverse impacts to these cumulative impacts.

Conclusion

Implementing alternative 3 would have long-term minor to moderate beneficial impacts and the continuation of long-term moderate adverse impacts on wetlands in the national seashore. The overall cumulative effects would be adverse and minor in intensity.

IMPACTS OF IMPLEMENTING ALTERNATIVE 4

Florida District Areas

Naval Live Oaks. Under alternative 4, some trails may be paved, and additional trails would be developed. Many of these trails are adjacent to wetlands, including the beaver pond trail, Andrew Jackson Trail, Naval Live Oaks nature trail, and Brackenridge Trail. These trails disrupt surface water flows, increase sheet runoff, prevent wetland migration, and would directly impact wetlands. Trail improvements/development would result in minor to moderate long-term adverse effects on wetlands.

Fort Pickens. If the road is washed out following a storm, it would be replaced, continuing to impact wetlands in the breech area. Any future construction or repair work related to this road would cause minor to moderate, long-term, adverse effects on wetlands.

The proposed diverse visitor opportunities zone would overlie ponds and other wetland areas where outdoor recreation and interpretive visitor opportunities are intermixed within both natural and developed environments. Visitation and incompatible visitor activities could increase in these sensitive

resource areas, potentially having moderate long-term adverse effects on wetlands.

Santa Rosa Island. The proposed diverse visitor opportunities zone would overlie ponds and other wetland areas north and west of the Opal Beach Pavilion where outdoor recreation and interpretive visitor opportunities are intermixed within both natural and developed environments. Visitation and incompatible visitor activities could increase in these sensitive resource areas, potentially creating moderate, long-term adverse effects on wetlands.

Mississippi District Areas

Davis Bayou. Under alternative 4, inadequate culverts would be replaced with appropriately sized culverts or bridging structures that would restore natural flows, including tidal flow and fluctuation and storm surge. The replacement of impermeable pavement with permeable surfaces would help capture surface water runoff and reduce sheet flow into adjacent wetlands. These actions would have minor, short term, adverse effects on wetlands during and immediately following construction and moderate beneficial effects on wetlands in Davis Bayou over the long term.

The construction of a multiuse trail would adversely affect wetlands within and adjacent to Davis Bayou. Also, runoff from this trail would increase sedimentation of wetlands. This trail would have moderate to major, long-term, adverse effects on wetlands.

Cat Island. A comprehensive wetland restoration effort would be made to restore natural processes via wetland restoration, including possible filling of dikes that block the natural flow of water. This restoration effort would have minor, short-term, adverse effects on wetlands during and immediately following construction and minor to moderate, beneficial effects on wetlands in the long term.

East and West Ship Islands. On West Ship Island, tractor use through the wetland would be discontinued, having moderate, long-term, beneficial effects.

The potential lowering of the water table to provide water for showers and toilets would continue to have moderate, long-term, adverse effects on wetlands. However, visitation levels and associated demand on groundwater would likely increase under this alternative compared to the no-action alternative, placing more stress on the water table.

The diverse visitor opportunities zone overlies some sensitive areas under alternative 4. This zone, where outdoor recreation and interpretive visitor opportunities are intermixed within both natural and developed environments, could also permit additional development and activities and would likely contribute to an increase in visitation and a dispersal of visitor activities. There would be negligible to moderate, long-term, adverse effects on wetlands. These adverse effects could be mitigated with appropriate site design directing visitors away from sensitive resources.

The removal of an abandoned well would temporarily disturb wetlands, creating moderate, short-term, adverse effects.

Horn and Petit Bois Islands. Administrative facilities on Horn Island would not be removed, but tractor use through the wetland would be discontinued. The tractor path through the wetland would be replaced with a boardwalk, and utility lines would be suspended beneath the structure. With the exception of the boardwalk, all disturbed areas would be restored to natural conditions, and berms and ditches would be removed to return natural surface water sheet flow through the marsh. All previously impacted areas would be replanted with native wetland vegetation. All of these actions would result in minor to moderate, long-term, beneficial effects on wetlands.

Cumulative Impacts

Past damming or diking of swales and wetlands to drain wet areas and walkways that were constructed across other wetland areas have continued to block the natural flow and drainage. Impacts continue to be moderate and adverse.

The National Park Service has a "no net loss of wetlands" policy, meaning that at least 1 acre of wetlands will be restored for each acre destroyed or degraded. Best management practices, such as storm water detention basins or other such structures, are used to protect wetlands and other resources. Continuing to implement these practices would result in minor to moderate, beneficial impacts.

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on wetlands may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of oil collected. These impacts may be minor to moderate in intensity.

Overall, the combined effects of these past, present, and future actions would be adverse and minor in intensity.

The primarily adverse effects of other past, present and future actions, combined with the long-term, moderate, beneficial and adverse impacts of implementing alternative 4, would result in minor, adverse cumulative impacts. Alternative 4 would comprise a small contribution of beneficial impacts to these cumulative impacts.

Conclusion

Implementing alternative 4 would have long-term, minor to moderate, beneficial impacts and long-term, moderate, adverse impacts on wetlands in the national seashore. The overall cumulative effects would be adverse and minor in intensity.

IMPACTS ON TERRESTRIAL VEGETATION AND WILDLIFE

METHODS AND ASSUMPTIONS FOR ANALYZING IMPACTS

Because a discussion of potential impacts on wildlife involves discussion of wildlife habitat, which is primarily the terrestrial vegetation communities in the national seashore, wildlife and vegetation are addressed together in this section. Impacts on vegetation and wildlife were evaluated by comparing projected changes resulting from the action alternatives to the no-action alternative. The thresholds for the level of impacts on these resources are defined as follows.

Negligible: Effects on individual plants, plant populations, or wildlife communities are not observable. Disturbance would be small and would not result in changes to plant community structure or composition beyond what would occur through natural processes.

Minor: Impacts are slight but detectable. Damage or enhancement to individual plants is restricted to herbs and small shrubs and does not affect belowground plant structures. Changes to plant or wildlife communities are limited in area and severity. Postdisturbance habitat usually returns quickly to predisturbance conditions.

Moderate: Impacts are apparent. The severity and timing of changes are expected to be outside natural variability, spatially and/or temporally. Post-disturbance habitats regain many characteristics of predisturbance communities, but differences generally persist for several years.

Major: Impacts are obvious without close inspection and may be severely adverse or exceptionally beneficial. A substantial area of vegetation or most of the inhabiting wildlife community would be affected. Changes in plant and animal species composition are dramatic because of species loss/recruitment or invasion of new species. Postdisturbance habitat may not resemble predisturbance communities, even after several years or decades.

IMPACTS OF IMPLEMENTING ALTERNATIVE 1

Florida District Areas

Naval Live Oaks. Under the no-action alternative, the utility corridor that supports maintenance operations and national seashore headquarters would continue to be used and maintained. The mowing and cutting of vegetation in this corridor would continue to have minor, long-term, adverse effects on terrestrial vegetation and wildlife habitat within Naval Live Oaks.

Pensacola Naval Air Station Historic Sites. There would be no change in the pre-Hurricane Ivan development footprint at any of the NPS managed properties within the Naval Air Station. Current management and visitation would remain the same. This alternative would have no new effect on terrestrial vegetation and wildlife habitat.

Perdido Key. Unrestricted use would continue at the eastern end of Perdido Key where visitors arrive primarily by boat and engage in recreational activities. Visitors have generated multiple unauthorized trails through existing island vegetation. These trails have resulted in the trampling and breaking of vegetation. Campers sometimes gather woody material, oftentimes cut from living plants, for use in campfires. At the western end of the national seashore lands on Perdido Key, the road continues to fragment habitat and prevent natural colonization by vegetation. Incidences of roadkill also continue to occur. All of these disruptions result in negligible to minor, long-term, adverse effects on terrestrial vegetation and wildlife.

Fort Pickens. The road from Pensacola Beach to Fort Pickens would continue to bisect

native plant communities and habitat. The road continues to prevent natural colonization by vegetation as a result of loss of natural habitat and through the prevention of dune formation, which is a core component of plant community succession on barrier islands. The road also has adverse impacts on wildlife, especially shorebirds, because of roadkill, nesting and feeding disruption, and habitat fragmentation caused by the road bisecting important habitat. Changes in traffic patterns on Fort Pickens Road may have impacts on shorebirds and their habitat, and continued mitigation would be necessary. Overall, the actions in alternative 3 would result in minor, long-term, adverse effects on terrestrial vegetation and wildlife.

Santa Rosa Island. When visitors walk on dunes, they impact fragile dune vegetation. The road and developed areas continue to reduce the area of contiguous wildlife habitat, and the road results in increases in mortality rates (roadkill). Similar to the Fort Pickens Road, impacts to shorebirds on J. Earle Bowden Way are expected to continue under this alternative. Changes in traffic patterns may have impacts on shorebirds and their habitat, and continued mitigation would be necessary. These conditions continue to have negligible to minor, long-term, adverse effects on terrestrial vegetation and wildlife.

Okaloosa. There would be no change in the pre-Hurricane Ivan development footprint at Okaloosa. Current management and visitation would remain the same. This alternative would have no new effects on terrestrial vegetation and wildlife habitat at Okaloosa.

Mississippi District Areas

Davis Bayou. Under the no-action alternative, there would be no change in the pre-Hurricane Ivan development footprint or management practices in Davis Bayou. Therefore, there would be no new effects on vegetation and wildlife.

Cat Island. Visitor use is not currently managed, and this unrestricted use would continue to result in unregulated and unauthorized visitor-created trails over dunes and through island vegetation, which has resulting in trampling and breaking of vegetation. The gathering of woody material, oftentimes cut from living plants, for use in campfires is also currently unrestricted and unregulated. There are long-term adverse effects from the presence of exotic species such as wild hogs, axis deer, nutria, black rats, and various plant species. All of these disruptions to Cat Island resources have minor, long-term, adverse effects on terrestrial vegetation and wildlife habitat.

East and West Ship Islands. There would be no change in the pre-Hurricane Ivan development footprint or use on West Ship Island, so there would be no new effects on terrestrial vegetation and wildlife from implementing this alternative.

On East Ship Island, overnight camping is not closely managed, resulting in unregulated and unauthorized visitor-created trails over dunes and other features and trampled vegetation. Firewood is gathered and cut without restrictions. Because vegetation is sparse and plant communities are relatively fragile on East Ship Island, these actions result in minor, long-term, adverse effects on terrestrial vegetation and wildlife habitat.

Horn and Petit Bois Islands. Overnight camping is not closely managed on Horn and Petit Bois islands, resulting in unauthorized visitor-created trails over dunes and other features, vegetation trampling, and unrestricted firewood gathering. Impacts from these activities would continue to be minor long term, and adverse.

Cumulative Impacts

The establishment of Gulf Islands National Seashore has resulted in minor beneficial impacts on vegetation and wildlife through protection of native vegetation and exotic species eradication efforts in some areas of the national seashore.

Gravel and asphalt debris that has been scattered as a result of past road surfaces being washed out during severe storms has had a minor adverse affect on vegetation because vegetation cannot grow through road rubble.

Prescribed fire was addressed in the national seashore's 2010 *Fire Management Plan* as a valid management tool to restore more natural and healthy plant communities. The results of implementing this plan would be beneficial for vegetation and wildlife.

Unrestricted boat landings and visitor use would continue to disrupt nesting shorebirds on nearby Spoil Island despite temporary/seasonal closures.

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on terrestrial vegetation and wildlife may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of oil collected. These impacts may be minor to moderate in intensity.

Overall, the combined effects of these past, present, and future actions would be adverse and minor in intensity.

The effects of other past, present and future actions, combined with the continued long-term, moderate, adverse impacts from the no-action alternative, would have minor adverse cumulative impacts. Alternative 1 would comprise a small contribution of adverse impacts to these cumulative impacts.

Conclusion

Implementing the no-action alternative would continue long-term, moderate, adverse impacts on terrestrial vegetation and wildlife in the national seashore. The overall cumulative effects would be adverse and minor in intensity.

IMPACTS OF IMPLEMENTING ALTERNATIVE 2

Florida District Areas

Naval Live Oaks. Under alternative 2, all utility lines in the Naval Live Oaks Area would be buried, and corridors would be revegetated following construction. NPS staff would determine the best location for utility lines—likely along road corridors and within the same rights-of-way as other utility lines. This practice would result in minor, short-term, adverse effects on wildlife and terrestrial vegetation during and immediately following construction, and long-term, minor, beneficial effects on terrestrial vegetation and habitat once vegetation becomes reestablished.

Pensacola Naval Air Station Historic Sites. There would be opportunities for regeneration of terrestrial vegetation along the closed Woodland Trail. This would have negligible, long-term, beneficial effects on terrestrial vegetation.

Perdido Key. The regulation of activities at the eastern end of Perdido Key and the application of zoning, including the nonmotorized primitive visitor opportunities zone, would help prevent continuing damage to island vegetation through education and direct management of visitor activities. The removal of the road following a destructive storm would improve conditions for vegetation by allowing natural processes to continue unimpeded and by opening available habitat. These actions would have minor to moderate, long-term, beneficial effects on terrestrial vegetation and wildlife on Perdido Key.

Fort Pickens. The anticipated impacts related to the removal of the road would be similar to those described for Perdido Key, leading to minor to moderate, long-term, beneficial effects on terrestrial vegetation and wildlife.

Santa Rosa Island. The anticipated impacts related to the removal of the road would be similar to those described for Perdido Key and Fort Pickens, leading to minor to moderate, long-term, beneficial effects on terrestrial vegetation and wildlife.

Okaloosa. There would be no change in the pre-Hurricane Ivan development footprint or use at Okaloosa, so there would be no new effects on terrestrial vegetation and wildlife.

Mississippi District Areas

Davis Bayou. Under alternative 2, forest management practices would be expanded to include restoration of the upland hardwood community and, like the wet pine community, could include prescribed fire. Impacts would be long term, moderate, and beneficial.

Also, the wet pine community adjacent to the entry road would be managed primarily for habitat and secondarily for screening. These actions would have moderate, long-term, beneficial effects on vegetation and wildlife habitat.

Cat Island. Increased access and visitation would likely create an increase in unauthorized visitor-created trails over dunes and other features, which would likely lead to further vegetation trampling and increased firewood gathering. This would result in minor to moderate, long-term, adverse effects on terrestrial vegetation and habitat on Cat Island. Expanding the exotic species eradication program would result in minor, long-term, beneficial impacts.

East and West Ship Islands. Overnight camping would be introduced to West Ship Island. Because vegetation is sparse and plant communities are relatively fragile on West Ship Island, this proposed new use would likely lead to increased vegetation trampling and firewood gathering by campers. The impacts on terrestrial habitat would be moderate, long term, and adverse.

Because vegetation communities are relatively fragile on both islands, implementing a permit system for camping would help educate campers about impacts on vegetation and wildlife and could lessen the impact of camping. Also, the use of a permit system could improve the dispersal of backcountry campers and would help spread out impacts of this activity. The resulting impacts on terrestrial habitat would likely be minor, long term, and beneficial.

Horn and Petit Bois Islands. Implementing a permit system for camping on these islands would provide an opportunity for NPS staff to educate campers about impacts on vegetation when issuing permits. Also, the use of a permit system could improve the dispersal of backcountry campers and would help spread out impacts of this activity. Because camping areas would be designated to a certain extent, NPS management could move camping areas or temporarily close campsites to allow vegetation to recover if resources become extensively impacted. NPS ability to actively manage backcountry camping on these islands would result in minor, long-term, beneficial effects on terrestrial vegetation.

Cumulative Impacts

The establishment of Gulf Islands National Seashore has resulted in minor beneficial impacts on vegetation and wildlife through protection of native vegetation and exotic species eradication efforts in some areas of the national seashore.

Gravel and asphalt debris that has been scattered as a result of past road surfaces being washed out during severe storms has had a minor adverse affect on vegetation because vegetation cannot grow through road rubble.

Prescribed fire was addressed in the national seashore's 2010 *Fire Management Plan* as a valid management tool to restore more natural and healthy plant communities. The results of implementing this plan would be beneficial for vegetation and wildlife.

Unrestricted boat landings and visitor use would continue to disrupt nesting shorebirds

on nearby Spoil Island despite temporary/ seasonal closures.

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on terrestrial vegetation and wildlife may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of oil collected. These impacts may be minor to moderate in intensity.

Overall, the combined effects of these past, present, and future actions would be adverse and minor in intensity.

The effects of other past, present and future actions, combined with the minor, long-term, beneficial impacts of implementing alternative 2, would result in minor adverse cumulative impacts. Alternative 2 would slightly reduce the overall adverse cumulative impacts.

Conclusion

Implementing alternative 2 would result in minor to moderate, long-term, beneficial impacts with several minor to moderate, long-term, adverse impacts on terrestrial vegetation and wildlife in the national seashore. The overall cumulative effects would be adverse and minor in intensity.

IMPACTS OF IMPLEMENTING ALTERNATIVE 3

Florida District Areas

Naval Live Oaks. Under alternative 3, all utility lines in the Naval Live Oaks Area would be buried, and corridors would be revegetated following construction. NPS staff would determine the best location for utility lines—likely along road corridors and within the same rights-of-way as other utility lines. This practice would have minor, short-term, adverse effects on terrestrial vegetation and wildlife during and immediately following construction, and minor beneficial effects on terrestrial vegetation in the long term once vegetation becomes reestablished.

The magnitude of impacts from restoring part of the historic live oak plantation would depend on the specific management techniques used and the area that would be restored. Restoration would result in improved vegetation and habitat, leading to minor to moderate beneficial impacts.

Pensacola Naval Air Station Historic Sites. Clearing trees to open vistas near Fort Barrancas would have negligible to minor, short- and long-term, adverse effects on terrestrial habitat. Thinning operations would be based on the rate of vegetation becoming reestablished.

Perdido Key. The regulation of activities at the eastern end of Perdido Key and the application of zoning, including the nonmotorized primitive visitor opportunities zone, would help prevent continuing damage to island vegetation through education and direct management of visitor activities. The removal of the road following a destructive storm would improve conditions for vegetation by allowing natural processes to continue unimpeded and by opening available habitat. These actions would create minor to moderate, long-term, beneficial effects on terrestrial vegetation and wildlife on Perdido Key.

Fort Pickens. The road from Pensacola Beach to Fort Pickens would continue to bisect native plant communities and habitat. The road would continue to prevent natural colonization by vegetation as a result of loss of habitat and through the prevention of dune formation, which is a core component of plant community succession on barrier islands. These actions would have minor, long-term, adverse effects on terrestrial vegetation.

Santa Rosa Island. When visitors walk on dunes, they impact fragile dune vegetation.

The road and developed areas continue to reduce the area of contiguous wildlife habitat, and the road results in increases in mortality rates (roadkill). These conditions continue to have negligible to minor, long-term, adverse effects on terrestrial vegetation and wildlife.

Okaloosa. There would be no change in the pre-Hurricane Ivan development footprint or use at Okaloosa, so there would be no new effects.

Mississippi District Areas

Davis Bayou. Under alternative 3, forest management practices would be expanded to include restoration of the upland hardwood community and, like the wet pine community, could include prescribed fire. This would result in moderate, long-term, beneficial impacts.

Also, the wet pine community adjacent to the entry road would be managed primarily for habitat and secondarily for screening. These actions would have moderate, long-term, beneficial effects on vegetation and wildlife habitat.

The construction of an interpretive pavilion and amphitheatre adjacent to the visitor center would expand the development footprint and visitor use in Davis Bayou, resulting in a localized loss of terrestrial vegetation minor, long-term, adverse effects.

Cat Island. Visitation would increase above that described in alternative 1, and the development of a campground would affect vegetation and wildlife in localized areas. The increased access and visitation would likely create an increase in visitor-created trails over dunes and other features, leading to further vegetation trampling and increased firewood gathering. These actions would result in minor to moderate, long-term, adverse effects on terrestrial vegetation and wildlife on Cat Island.

East and West Ship Islands. Overnight camping would be introduced to West Ship Island. Because vegetation is sparse and plant communities are relatively fragile on West Ship Island, this proposed new use would likely lead to increased vegetation trampling and firewood gathering by campers. Resulting impacts on terrestrial vegetation would be moderate, long term, and adverse.
Because vegetation communities are relatively fragile on both islands, implementing a permit system for camping would allow NPs staff to help to educate campers about impacts on vegetation and wildlife when issuing permits, and this could lessen the impact of camping. Also, the use of a permit system could improve the dispersal of backcountry campers and would help spread out impacts of this activity. Impacts on terrestrial vegetation would be minor, long term, and beneficial.

Horn and Petit Bois Islands. Implementing a permit system for camping on the islands would provide an opportunity for NPS staff to educate campers about impacts on vegetation when issuing permits. Also, the use of a permit system could improve the dispersal of back-country campers and would help to spread out impacts of this activity. Because camping areas would be assigned to a certain extent, NPS management could move camping areas or temporarily close campsites to allow vegetation to recover if resources become extensively impacted. NPS staff ability to actively manage backcountry camping on the islands would have minor, long-term, beneficial effects on terrestrial vegetation.

Cumulative Impacts

The establishment of Gulf Islands National Seashore has resulted in minor beneficial impacts on vegetation and wildlife through protection of native vegetation and exotic species eradication efforts in some areas of the national seashore.

Gravel and asphalt debris that has been scattered as a result of past road surfaces being washed out during severe storms has had a minor adverse affect on vegetation because vegetation cannot grow through road rubble.

Prescribed fire was addressed in the national seashore's 2010 *Fire Management Plan* as a valid management tool to restore more natural and healthy plant communities. The results of implementing this plan would be beneficial for vegetation and wildlife.

Unrestricted boat landings and visitor use would continue to disrupt nesting shorebirds on nearby Spoil Island despite temporary/seasonal closures.

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on terrestrial vegetation and wildlife may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of oil collected. These impacts may be minor to moderate in intensity.

Overall, the combined effects of these past, present, and future actions would be adverse and minor in intensity.

The effects of other past, present and future actions, combined with the minor to moderate, long-term, adverse impacts of implementing alternative 3, would result in minor, adverse, cumulative impacts. Alternative 3 would comprise a slight contribution of adverse impacts to these cumulative impacts.

Conclusion

Implementing alternative 3 would largely result in minor to moderate, long-term, adverse impacts and some minor to moderate, long-term, beneficial impacts on terrestrial vegetation and wildlife in the national seashore. The overall cumulative effects would be adverse and minor in intensity.

IMPACTS OF IMPLEMENTING ALTERNATIVE 4

Florida District Areas

Naval Live Oaks. Under alternative 4, all utility lines in the Naval Live Oaks Area would be buried, and corridors would be revegetated following construction. NPS staff would determine the best location for utility lines—likely along road corridors and in the same rights-of-way as other utility lines. This practice would have minor, short-term, adverse effects on terrestrial vegetation during and immediately following construction, and minor, beneficial effects on terrestrial vegetation in the long term once vegetation becomes reestablished.

The magnitude of impacts from restoring part of the historic live oak plantation would depend on the specific management techniques used and the area that would be restored. Restoration would result in improved vegetation and habitat, leading to minor to moderate beneficial impacts.

The expanded campground and parking areas would result in localized loss of habitat and would have minor to moderate, long-term, adverse effects.

Pensacola Naval Air Station Historic Sites. Clearing trees to open vistas near Fort Barrancas would have negligible to minor, short- and long-term, adverse effects on terrestrial vegetation and wildlife. Thinning operations would be based on the rate of vegetation becoming reestablished.

Perdido Key. The regulation of activities at the eastern end of Perdido Key would help prevent continuing damage to island vegetation through education and direct management of visitor activities. Resulting impacts on terrestrial vegetation and habitat would be minor to moderate, long term, and beneficial.

The road at the western end of the national seashore lands on Perdido Key would continue to prevent natural colonization by vegetation. Incidents of roadkill would also continue. These conditions would continue to result in negligible to minor, long-term,

adverse effects. Additionally, the proposed new facilities and 0.5-mile-long trail would affect vegetation in localized areas at Johnson Beach. Resulting impacts on terrestrial vegetation and habitat would be minor, long term, and adverse.

Fort Pickens. The road from Pensacola Beach to Fort Pickens would continue to bisect native plant communities and habitat. The road would also continue to prevent natural colonization by vegetation as a result of loss of habitat and through the prevention of dune formation, which is a core component of plant community succession on barrier islands. These actions would have minor long-term, adverse effects on vegetation and wildlife.

Activities permitted in the diverse visitor opportunities zone could include additional development and would likely contribute to an increase in visitation and a dispersal of visitor activities. Because this zone would overlie areas capable of absorbing a diverse range of outdoor recreation and interpretive visitor opportunities intermixed within both natural and developed environments, there could be negligible to minor, long-term, adverse effects on terrestrial vegetation and wildlife depending on the level and intensity of use and associated visitor activities. These adverse effects could be mitigated with appropriate site design directing visitors away from sensitive resources.

Santa Rosa Island. The expanded development footprint would result in a localized loss of terrestrial vegetation and additional fragmentation of wildlife habitat. When visitors walk on dunes they impact fragile dune vegetation; however, increased visitor use would likely exacerbate this problem leading to more visitor-created trails and localized loss of terrestrial vegetation. These actions would continue to have minor to moderate, long-term, adverse effects.

Okaloosa. The expanded development footprint would result in a localized loss of terrestrial vegetation and additional habitat fragmentation. Increased visitor use could lead to more visitor-created trails and localized loss of terrestrial vegetation from trampling. These actions would have negligible to minor, long-term, adverse effects on terrestrial vegetation and habitat.

Mississippi District Areas

Davis Bayou. Under alternative 4, forest management practices would be expanded to include restoration of the upland hardwood community and, like the wet pine community, could include prescribed fire. This expanded action would result in moderate, long-term, beneficial effects on this plant community.

Also, managing the wet pine community adjacent to the entry road primarily for screening and secondarily for habitat would still provide some benefit to this community, resulting in minor, long-term, beneficial effects.

The construction of an interpretive pavilion and amphitheatre adjacent to the visitor center would expand the development footprint in Davis Bayou. This would result in a localized loss of terrestrial vegetation and have minor, long-term, adverse effects.

The construction of a multiuse trail would also expand the development footprint in Davis Bayou, resulting in a localized loss of terrestrial vegetation and habitat. Impacts would be minor, short and long term, and adverse.

Cat Island. Visitation would increase above that described in alternative 1, and the development of a campground, bunkhouse, and research facility would affect vegetation in localized areas. The increased access and visitation would likely create an increase in visitor-created trails over dunes and other features, leading to further vegetation trampling and increased firewood gathering. A greater ease of access to remote areas by individual canoes, kayaks, or other means (rental business) might create additional disturbances to wildlife and habitat. These actions would result in moderate, long-term,

adverse effects on terrestrial vegetation and wildlife on Cat Island.

East and West Ship Islands. Overnight camping would be introduced to West Ship Island. Because vegetation is sparse and plant communities are relatively fragile on West Ship Island, this proposed new use would likely lead to increased vegetation trampling and firewood gathering by campers. Resulting impacts on terrestrial vegetation would be moderate, long term, and adverse.

Because vegetation communities are relatively fragile on both islands, implementing a permit system for camping would allow NPs staff to help to educate campers about impacts on vegetation and wildlife when issuing permits, and this could lessen the impact of camping. Also, the use of a permit system could improve the dispersal of backcountry campers and would help spread out impacts of this activity. Impacts on terrestrial vegetation would be minor, long term, and beneficial.

Activities permitted in the diverse visitor opportunities zone would overlie areas capable of absorbing a diverse range of outdoor recreation and interpretive visitor opportunities intermixed within both natural and developed environments. This could include additional development and would likely contribute to an increase in visitation and a dispersal of visitor activities. Because this zone is in vegetated habitat areas on West Ship Island under alternative 4, the associated activities and possible development would have minor to moderate, long-term, adverse effects on terrestrial vegetation and wildlife habitat. These adverse effects could be mitigated with appropriate site design directing visitors away from sensitive resources.

Horn and Petit Bois Islands. Implementing a permit system for camping on these islands would provide an opportunity for NPS staff to educate campers about impacts on vegetation when issuing permits. Also, the use of a permit system could improve the dispersal of backcountry campers and would help to spread out impacts of this activity. Because camping areas would be assigned to a certain extent, NPS management could move camping areas or temporarily close campsites to allow vegetation to recover if resources become extensively impacted. NPS ability to actively manage backcountry camping on these islands would have minor, long-term, beneficial effects on terrestrial vegetation.

Cumulative Impacts

The establishment of Gulf Islands National Seashore has resulted in minor beneficial impacts on vegetation and wildlife through protection of native vegetation and exotic species eradication efforts in some areas of the national seashore.

Gravel and asphalt debris that has been scattered as a result of past road surfaces being washed out during severe storms has had a minor adverse affect on vegetation because vegetation cannot grow through road rubble.

Prescribed fire was addressed in the national seashore's 2010 *Fire Management Plan* as a valid management tool to restore more natural and healthy plant communities. The results of implementing this plan would be beneficial for vegetation and wildlife.

Unrestricted boat landings and visitor use would continue to disrupt nesting shorebirds on nearby Spoil Island despite temporary/seasonal closures.

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on terrestrial vegetation and wildlife may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of oil collected. These impacts may be minor to moderate in intensity.

Overall, the combined effects of these past, present, and future actions would be adverse and minor in intensity.

The effects of other past, present and future actions, combined with the minor to moderate, long-term, adverse impacts and a moderate, long-term, beneficial impact of implementing alternative 4, would be minor and adverse cumulative impacts. Alternative 4 would comprise a slight contribution of adverse impacts to these cumulative effects.

Conclusion

Implementing alternative 4 would result in minor to moderate, long-term, adverse impacts and a moderate, long-term, beneficial impact on terrestrial vegetation and wildlife in the national seashore. The overall cumulative effects would be adverse and minor in intensity.

IMPACTS ON AQUATIC VEGETATION AND WILDLIFE

METHODS AND ASSUMPTIONS FOR ANALYZING IMPACTS

Because a discussion of potential impacts on marine life involves discussion of habitat, which is primarily the marine vegetation communities in the national seashore (e.g., seagrass habitat), marine life and vegetation are addressed together in this section. Impacts were evaluated by comparing projected changes resulting from the action alternatives to the no-action alternative. Impacts are described only for those units of the national seashore that have marine resources that could be affected by one or more of the alternatives. The thresholds for the level of impacts on these resources are defined as follows:

Negligible: The impact on individuals (plants or animals) and/or communities would not be measurable. The abundance or distribution of individuals would be only slightly affected. Ecological processes and biological productivity would not be affected.

Minor: An action would affect the abundance or distribution of individuals in a localized area but would not affect the viability of local or regional populations or communities and not necessarily decrease or increase the area's overall biological productivity.

Moderate: An action would result in a change in overall biological productivity in a small area. An action would cause a change in abundance or distribution, but it would not affect the viability of the regional population or communities. Changes in ecological processes would be of limited extent.

Major: An action would affect important ecological processes and overall biological productivity in a relatively large area. An action would cause a change in abundance or in distribution to the extent that the population or communities would not be likely to return to its/their former level (adverse), or would return to a sustainable level (beneficial).

IMPACTS OF IMPLEMENTING ALTERNATIVE 1

Florida District Areas

Naval Live Oaks. Under the no-action alternative, submerged aquatic vegetation and marine habitat continue to be affected by unrestricted boat landings that damage seagrass beds and nursery habitat on the south side of Naval Live Oaks through propeller scarring, vessel groundings, and damage from anchors. These activities continue to have minor to moderate, long-term, adverse effects on aquatic vegetation.

Perdido Key. At Perdido Key, motorized boat use is prohibited in Spanish Cove and in the cove between Langley and Redfish points to protect seagrass beds. However, unrestricted boat landings would continue to degrade seagrass habitat in most other areas along Perdido Key through propeller scarring, vessel groundings, and damage from anchors—continuing to have minor, adverse effects on aquatic vegetation.

Fort Pickens. Unrestricted boat landings would continue to degrade seagrass beds through propeller scarring, vessel groundings, and damage from anchors. Impacts would continue to be minor to moderate and adverse on aquatic vegetation.

Santa Rosa Island. Anticipated impacts would be similar to those described for Fort Pickens.

Mississippi District Areas

Davis Bayou. No change to management or use of the aquatic habitat around Davis Bayou

would be anticipated, so there would be no new effects.

Cat Island. Visitation is relatively low due to the shallow, waters that are difficult to navigate that surround the island. Visitor use is not currently managed. Seagrass beds would continue to be degraded by propeller scarring and vessel groundings from unrestricted boat landings. Negligible, long-term, adverse effects would continue.

East and West Ship Islands. Continuing the sand replenishment program causes rapid influx of loose, unconsolidated sediment and buries seagrasses. Depending on location and practice, sand replenishment would continue to cause moderate to major adverse effects on seagrass and the animals that depend on it in the short-term. However, long-term benefits of the restoration of more natural barrier island processes are anticipated, including more natural vegetation and wildlife communities in the area of replenishment and nearby.

Horn and Petit Bois Islands. Impacts would be similar to those described for Cat Island.

Cumulative Impacts

Overall health of seagrass beds has been declining for the past 60 years across the entire Gulf Coast. This may be because of increased turbidity from harbor and channel dredging, boat traffic, shoreline modification, shoreline development, or natural events such as hurricanes and changes in salinity. Human and natural causes have substantially changed species composition and decreased habitat in some areas by as much as 80% since the 1950s, creating moderate to major adverse impacts on marine vegetation and wildlife.

Nonnative jellyfish, clams, crabs, fish, and snails have been and are being introduced to Gulf waters from ships. These potentially invasive and/or harmful organisms have moderate adverse impacts on native marine life.

Gravel and asphalt debris that has been scattered throughout the marine shallows as a result of past road surfaces being washed out during storms have had and likely would continue to have an adverse effect on aquatic vegetation because turbidity, petrochemicals, and pieces of large debris impede seagrass growth. This is a continuing minor adverse impact on seagrass habitat.

Ongoing monitoring efforts that document the health and condition of seagrass beds, coupled with implementing adaptive management responses to threats, provide proactive protection measures for these resources and would continue to result in minor, long-term, beneficial effects on aquatic vegetation and habitat.

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on aquatic vegetation and wildlife may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of oil collected. These impacts may be minor to moderate in intensity.

Overall, the combined effects of these past, present, and future actions would be adverse and moderate in intensity.

The adverse effects of other past, present and future actions, combined with the minor to moderate, long-term, adverse impacts of implementing alternative 1, would result in moderate, adverse, cumulative impacts. Alternative 1 would comprise a small contribution of adverse impacts to these cumulative impacts.

Conclusion

Implementing alternative 1 would result in minor to major, long-term, adverse impacts on aquatic vegetation and marine life in the

national seashore, with long-term major benefits of sand replenishment activities. The overall cumulative effects would be adverse and moderate in intensity.

There may be localized, major short-term adverse impacts on some seagrass communities and wildlife due to sand replenishment in the short-term near East and West Ship islands. However, overall these actions would be beneficial and long-term, and would return more natural barrier island processes in those areas being replenished with sand.

IMPACTS OF IMPLEMENTING ALTERNATIVE 2

Florida District Areas

Naval Live Oaks. Under alternative 2, the construction and maintenance of public docks and piers on the south side of Naval Live Oaks would disrupt seagrass beds within a limited area, causing minor, long-term, adverse effects on aquatic vegetation.

Perdido Key. The implementation of a nonmotorized primitive visitor opportunities zone and associated permitted activities would greatly improve conditions for seagrass beds compared to existing conditions. Moderate, long-term, beneficial effects on aquatic habitat in prime seagrass bed areas would result.

Fort Pickens. The implementation of a seagrass bed protection zone would greatly improve conditions for seagrass beds compared to existing conditions. The seagrass bed protection zone would prohibit motorized boat use when impacts are determined to be severe. Implementation of this zoning would result in minor to moderate, long-term, beneficial effects on aquatic habitat.

Santa Rosa Island. The anticipated impacts under this alternative would be similar to those described for Fort Pickens.

Mississippi District Areas

Davis Bayou. Increased general boat activity, including ferries to and from Davis Bayou under this alternative, would adversely affect Ruppia beds, and wave action from boats would adversely affect marsh communities by disturbing marine life and uprooting plants. Impacts from these activities would be minor, long term, and adverse.

Cat Island. Increased access and boating activity would require additional dredging and would continue to degrade seagrass habitat through propeller scarring and vessel groundings. Impacts from these activities would be minor, long term, and adverse.

East and West Ship Islands. Extending the nonmotorized primitive visitor opportunities zone into the water from these islands would protect the seagrass habitat from damage by motorboats. Resulting impacts would be moderate, long term, and beneficial.

Continuing the sand replenishment program causes rapid influx of loose, unconsolidated sediment and buries seagrasses. Depending on location and practice, sand replenishment would continue to cause moderate to major adverse effects on seagrass and the animals that depend on it in the short-term. However, long-term benefits of the restoration of more natural barrier island processes are anticipated, including more natural vegetation and wildlife communities in the area of replenishment and nearby.

Horn and Petit Bois Islands. Impacts expected under this alternative would be similar to those described for the Ship islands except for the sand replenishment program.

Cumulative Impacts

Overall health of seagrass beds has been declining for the past 60 years across the entire Gulf Coast. This may be because of increased turbidity from harbor and channel dredging, boat traffic, shoreline modification, shoreline development, or natural events such

as hurricanes and changes in salinity. Human and natural causes have substantially changed species composition and decreased habitat in some areas by as much as 80% since the 1950s, creating moderate to major adverse impacts on marine vegetation and wildlife.

Nonnative jellyfish, clams, crabs, fish, and snails have been and are being introduced to Gulf waters from ships. These potentially invasive and/or harmful organisms have moderate adverse impacts on native marine life.

Gravel and asphalt debris that has been scattered throughout the marine shallows as a result of past road surfaces being washed out during storms have had and likely would continue to have an adverse effect on aquatic vegetation because turbidity, petrochemicals, and pieces of large debris impede seagrass growth. This is a continuing minor adverse impact on seagrass habitat.

Ongoing monitoring efforts that document the health and condition of seagrass beds, coupled with implementing adaptive management responses to threats, provide proactive protection measures for these resources and would continue to result in minor, long-term, beneficial effects on aquatic vegetation and habitat.

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on aquatic vegetation and wildlife may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of oil collected. These impacts may be minor to moderate in intensity.

Overall, the combined effects of these past, present, and future actions would be adverse and moderate in intensity.

The adverse effects of other past, present, and future actions, combined with the moderate, long-term, beneficial impacts of implementing alternative 2, would have moderate adverse cumulative impacts. Alternative 2 would contribute an increment that would slightly reduce the overall adverse cumulative impacts via beneficial actions in some locations.

Conclusion

Overall, implementing alternative 2 would result in moderate to major, long-term, beneficial impacts on aquatic vegetation and marine life in the national seashore. The overall cumulative effects would be adverse and moderate in intensity.

There may be localized, major short-term adverse impacts on some seagrass communities and wildlife due to sand replenishment in the short-term near East and West Ship islands. However, overall these actions would be beneficial and long-term, and would return more natural barrier island processes in those areas being replenished with sand.

IMPACTS OF IMPLEMENTING ALTERNATIVE 3

Florida District Areas

Naval Live Oaks. Under alternative 3, the construction and maintenance of public docks and piers on the south side of Naval Live Oaks would disrupt seagrass beds within a limited area, causing minor, long-term, adverse effects on aquatic vegetation and habitat.

Perdido Key. The implementation of a seagrass bed protection zone would greatly improve conditions for seagrass beds compared to existing conditions. The seagrass bed protection zone would prohibit motorized boat use when impacts are determined to be excessive. The long-term, beneficial effects on aquatic vegetation would be minor under alternative 3.

Fort Pickens. The anticipated impacts on aquatic habitat would be similar to those described for Perdido Key.

Santa Rosa Island. The anticipated impacts on aquatic habitat would be similar to those described for Perdido Key.

Mississippi District Areas

Davis Bayou. Increased general boat activity, including ferries to and from Davis Bayou, would adversely affect Ruppia beds, and wave action from boats would adversely affect marsh communities by disturbing marine life and uprooting vegetation. Continued dredging operations from the boat launch facility would also adversely affect Ruppia beds and marsh communities through increased turbidity, subsidence, and wave action. These actions would result in moderate, long-term, adverse impacts.

Moderate, short-term, adverse effects would occur to Ruppia beds in front of boat slips and the visitor center from erosion caused by the proposed boat facility construction and other land-based construction activities. Growth and reestablishment of Ruppia would depend on the level of disturbance.

Cat Island. Proposed increased access and boating activity would require additional dredging and would increase degradation of seagrass beds from propeller scarring and vessel groundings. Resulting impacts would be minor to moderate, long term, and adverse.

East and West Ship Islands. Extending the seagrass bed protection zone into the water from these islands would protect the seagrass habitat from damage by motorboats—resulting in minor, long-term, beneficial effects.

Continuing the sand replenishment program causes rapid influx of loose, unconsolidated sediment and buries seagrasses. Depending on location and practice, sand replenishment would continue to cause moderate to major adverse effects on seagrass and the animals that depend on it in the short-term. However, major benefits of the restoration of more natural barrier island processes are anticipated in the long-term, including more natural vegetation and wildlife communities in the area of replenishment and nearby.

Horn and Petit Bois Islands. Impacts from alternative 3 would be similar to those described for the Ship islands except for the sand replenishment program.

Cumulative Impacts

Overall health of seagrass beds has been declining for the past 60 years across the entire Gulf Coast. This may be because of increased turbidity from harbor and channel dredging, boat traffic, shoreline modification, shoreline development, or natural events such as hurricanes and changes in salinity. Human and natural causes have substantially changed species composition and decreased habitat in some areas by as much as 80% since the 1950s, creating moderate to major adverse impacts on marine vegetation and wildlife.

Nonnative jellyfish, clams, crabs, fish, and snails have been and are being introduced to Gulf waters from ships. These potentially invasive and/or harmful organisms have moderate adverse impacts on native marine life.

Gravel and asphalt debris that has been scattered throughout the marine shallows as a result of past road surfaces being washed out during storms have had and likely would continue to have an adverse effect on aquatic vegetation because turbidity, petrochemicals, and pieces of large debris impede seagrass growth. This is a continuing minor adverse impact on seagrass habitat.

Ongoing monitoring efforts that document the health and condition of seagrass beds, coupled with implementing adaptive management responses to threats, provide proactive protection measures for these resources and would continue to result in minor, long-

term, beneficial effects on aquatic vegetation and habitat.

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on aquatic vegetation and wildlife may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of oil collected. These impacts may be minor to moderate in intensity.

Overall, the combined effects of these past, present, and future actions would be adverse and moderate in intensity.

The adverse effects of other past, present and future actions, combined with the minor to moderate, long-term, beneficial impacts and a moderate, long-term, adverse impact from actions proposed in alternative 3, would result in a moderate adverse cumulative impact. Alternative 3 would comprise a small beneficial contribution and small adverse contribution to these cumulative impacts.

Conclusion

Overall, implementing alternative 3 would result in minor to major, long-term, beneficial impacts and a moderate, long-term, adverse impact on aquatic vegetation and marine life in the national seashore. The overall cumulative effects would be adverse and moderate in intensity.

There may be localized, major short-term adverse impacts on some seagrass communities and wildlife due to sand replenishment in the short-term near East and West Ship islands. However, overall these actions would be beneficial and long-term, and would return more natural barrier island processes in those areas being replenished with sand.

IMPACTS OF IMPLEMENTING ALTERNATIVE 4

Florida District Areas

Naval Live Oaks. Alternative 4 would provide expanded recreation opportunities compared to all alternatives. This change in type and level of use would slightly affect the health and integrity of marine habitat, resulting in negligible, long-term, adverse impacts.

The construction and long-term maintenance of public docks on the south side of Naval Live Oaks in seagrass beds that occur within a limited area would affect these resources because of expanded recreational opportunities and activities and would result in moderate, long-term, adverse effects on aquatic vegetation and habitat.

Perdido Key. The implementation of a seagrass bed protection zone would greatly improve conditions for seagrass beds compared to existing conditions. The seagrass bed protection zone would prohibit motorized boat use when impacts are determined to be excessive. The long-term, beneficial effects on aquatic vegetation would be minor under alternative 4.

Fort Pickens. The anticipated impacts related to zoning would be similar to those described for Perdido Key.

Santa Rosa Island. The anticipated impacts related to zoning would be similar to those described for Perdido Key.

Mississippi District Areas

Davis Bayou. Increased general boat activity, including ferries to and from Davis Bayou, would adversely affect Ruppia beds, and wave action from boats would adversely affect marsh communities by disturbing marine life and uprooting vegetation. Continuing dredging operations from the boat launch facility would also adversely affect Ruppia beds and marsh communities through increased turbidity, subsidence, and wave

action. These actions would result in moderate, long-term, adverse impacts.

Moderate, short-term, adverse effects would occur to Ruppia beds in front of boat slips and the visitor center from erosion caused by the proposed boat facility construction and other land-based construction activities. Growth and reestablishment of Ruppia would depend on level of disturbance.

Cat Island. Proposed increased access and boating activity would require additional dredging and would increase degradation of seagrass beds from propeller scarring and vessel groundings. Resulting impacts would be minor to moderate, long term, and adverse.

East and West Ship Islands. Extending the seagrass bed protection zone into the water from these islands would protect the seagrass habitat from damage by motorboats—resulting in minor, long-term, beneficial effects.

Continuing the sand replenishment program causes rapid influx of loose, unconsolidated sediment and buries seagrasses. Depending on location and practice, sand replenishment would continue to cause moderate to major adverse effects on seagrass and the animals that depend on it in the short-term. However, major benefits of the restoration of more natural barrier island processes are anticipated in the long-term, including more natural vegetation and wildlife communities in the area of replenishment and nearby.

Horn and Petit Bois Islands. Impacts would be similar to those described for the Ship islands except for the sand replenishment program.

Cumulative Impacts

Overall health of seagrass beds has been declining for the past 60 years across the entire Gulf Coast. This may be because of increased turbidity from harbor and channel dredging, boat traffic, shoreline modification, shoreline development, or natural events such as hurricanes and changes in salinity. Human and natural causes have substantially changed species composition and decreased habitat in some areas by as much as 80% since the 1950s, creating moderate to major adverse impacts on marine vegetation and wildlife.

Nonnative jellyfish, clams, crabs, fish, and snails have been and are being introduced to Gulf waters from ships. These potentially invasive and/or harmful organisms have moderate adverse impacts on native marine life.

Gravel and asphalt debris that has been scattered throughout the marine shallows as a result of past road surfaces being washed out during storms have had and likely would continue to have an adverse effect on aquatic vegetation because turbidity, petrochemicals, and pieces of large debris impede seagrass growth. This is a continuing minor adverse impact on seagrass habitat.

Ongoing monitoring efforts that document the health and condition of seagrass beds, coupled with implementing adaptive management responses to threats, provide proactive protection measures for these resources and would continue to result in minor, long-term, beneficial effects on aquatic vegetation and habitat.

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on aquatic vegetation and wildlife may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of oil collected. These impacts may be minor to moderate in intensity.

Overall, the combined effects of these past, present, and future actions would be adverse and moderate in intensity.

The adverse effects of other past, present, and future actions, combined with the minor to moderate, long-term, beneficial impacts and a moderate, long-term, adverse impact of alternative 4, would result in moderate adverse cumulative impacts. Alternative 4 would comprise a small beneficial contribution and small adverse contribution to these cumulative impacts.

Conclusion

Implementing alternative 4 would result in minor to major, long-term, beneficial impacts and a moderate, long-term, adverse impact on aquatic vegetation and marine life in the national seashore. The overall cumulative effects would be adverse and moderate in intensity.

There may be localized, major short-term adverse impacts on some seagrass communities and wildlife due to sand replenishment in the short-term near East and West Ship islands. However, overall these actions would be beneficial and long-term, and would return more natural barrier island processes in those areas being replenished with sand.

IMPACTS ON SPECIES OF SPECIAL CONCERN

METHODS AND ASSUMPTIONS FOR ANALYZING IMPACTS

Through coordination with the U.S. Fish and Wildlife Service and wildlife management agencies for Mississippi and Florida, listed species were identified that may be in or near the national seashore. Information on each species, including their preferred habitat, prey, and foraging areas, was gathered. Short-term impacts would last one year or less; long-term impacts would occur for more than one year. Impacts on special status species were determined based on the following criteria:

1. Species are found in areas likely to be affected by management actions or associated activities described in the alternatives.
2. Current and future use and distribution of visitor activities based on proposed management zones.
3. Potential impacts on wildlife species from management actions or visitor use include inducing flight and alarm responses, disrupting normal behaviors and causing stress, degrading habitat quality, and potentially affecting reproductive success.
4. Displacement and disturbance potential of the actions, and the species' potential to be affected by visitor activities.
5. Plant species at risk from direct and indirect impacts associated with management actions and visitor uses such as direct impacts on species and/or habitat based on proposed development or from trampling due to associated visitor activities.
6. Mitigative measures designed to lessen impacts on special status species.

Federal and state listed threatened and endangered species are addressed together in this section, because many of these species (1) have dual federal and state special status, (2) occur in the same habitats, or (3) would be impacted similarly under each alternative.

No known special status species are in the Pensacola Naval Air Station Historic Sites or in the Okaloosa Area, so these areas are not discussed in this section.

For special status species, the following impact intensities were used. Additionally, Endangered Species Act determination language was also included for alternative 3, the NPS preferred alternative, to be consistent with the language used to describe effects on threatened and endangered species under section 7 of the Endangered Species Act.

See Chapter 2, Mitigative Measures for detailed information on sea turtle, gopher tortoise, shorebird, and Perdido Key beach mouse monitoring and mitigation measures, and mitigation meausres for special staus species in general, that would continue under all action alternatives.

No effect: The action would have no effect on the special status species or critical habitat. This effect intensity equates to a section 7 *"no effect"* determination.

Negligible: The action could result in a change to a population or individuals of a species or designated critical habitat, but the change would be so small that it would not be of any measurable or perceptible consequence and would be within natural variability. This effect intensity equates to a section 7 *"may affect, not likely to adversely affect"* determination.

Minor: The action could result in a change to a population or individuals of a species or designated critical habitat. The change would be measurable, but would be small and localized, and in many cases incidental. This effect intensity equates to a section 7 *"may affect, not likely to adversely affect"* determination.

Moderate: The action could result in a detectable change to a population or individuals of a species or designated critical habitat. Changes to the population or habitat might deviate from natural

variability, but the changes would not threaten the continued existence of the species in the national seashore. This effect intensity equates to a section 7 *"may affect, not likely to adversely affect"* if beneficial or a *"likely to adversely affect"* determination if adverse.

Major: The action would result in a noticeable effect on the viability of a population or individuals of a species or designated critical habitat. Changes to the population or habitat would substantially deviate from natural variability and either threaten or help ensure the continued existence of the species in the national seashore. A major adverse effect would be considered a "take" situation and would equate to a section 7 *"likely to adversely affect"* determination. A major adverse effect may also be likely to jeopardize proposed species, or adversely modify proposed critical habitat. A major beneficial effect would receive a *"not likely to adversely affect"* determination under the Endangered Species Act.

As explained in detail in Chapter 3, "Affected Environment," climate change is anticipated to alter water and air temperature, water quality, severe weather events, and vegetation and wildlife. The National Park Service is required to protect federally listed species, and by policy, supports species listed by Florida and Mississippi. Climate change may cause alterations in listed species' habitat, breeding and nesting timing and success, predator-prey relationships, and the food web that supports these species. Some of these changes may be difficult to distinguish from other natural processes such as barrier island migration. The national seashore will work with U.S. Fish and Wildlife and the appropriate state agencies to determine and implement new mitigation or management actions to support species health and population stability as the dynamic effects of climate change become apparent over the life of this general management plan.

IMPACTS OF IMPLEMENTING ALTERNATIVE 1

Florida District Areas

Naval Live Oaks. Gopher tortoises occur in this area and have been killed by vehicles while crossing roads, including the service road to the NPS maintenance facility. This alternative would not change existing conditions or situations for this species and so it would have no new affect on special status species in this area.

Perdido Key. The listed Perdido Key beach mouse, shorebirds, sea turtles and other marine species may be present and could be affected by visitor use. Use at Johnson Beach and the eastern tip of island, especially at night, could create potential problems and would require monitoring. The presence of the road would continue to affect wildlife habitat and cause direct mortality from roadkill. The Perdido Key beach mouse is now only found in the national seashore in the developed area at Johnson Beach, the eastern tip of the island, and the larger dunes in the center of the island. Sea turtles use the beach at night, and the effect of artificial lighting has been shown to be adverse. The national seashore continues to study artificial lighting impacts on sea turtles and to implement lighting standards in the seashore and surrounding areas with the help of community partners. Unrestricted access at the eastern tip is of particular concern based on recent declines in Perdido Key beach mouse counts. Implementing this alternative would have no new affect on special status species.

Fort Pickens. Shorebirds, sea turtles and other marine species may be present and could be affected by visitor use. Implementing this alternative would not result in a change affecting special status species or their habitat in this area.

Santa Rosa Island. Beach mouse, shorebirds, sea turtles and other marine species may be present and could be affected by visitor use. Implementing this alternative would not result

in a change affecting special status species or their habitat in this area.

Mississippi District Areas

Davis Bayou. State and federal species that live in Davis Bayou are likely not adversely affected by current activities. Habitat exists for many species that do not live within Davis Bayou. The continuation of current actions would have no new effects.

Cat Island. Cat Island is remote and infrequently visited. This situation is expected to continue, so this alternative would have no new effect on listed species.

East and West Ship Islands. Avian and aquatic species (including turtles) use these islands and would be the species most affected by current visitor use trends. Continuation of current actions would not result in a change affecting special status species or their habitat in this area.

Horn and Petit Bois Islands. Avian and aquatic species are primarily the species most affected by current visitor use trends, including unrestricted motorboat access and overnight camping. Current seasonal closures for ospreys and colonial shorebirds result in long-term, beneficial impacts.

Cumulative Impacts

Overfishing, habitat loss, and degradation are the most common reasons for a wildlife or plant species to become threatened or endangered. Loss or fragmentation of habitat has occurred in the region around the national seashore as a result of commercial and residential development. Human-related land uses on private, state, and federal land have disrupted or fragmented terrestrial and marine habitat, displaced individuals, or otherwise caused stress to animals. Incremental development of the region has changed the quality and capacity of habitats, resulting in the decrease of population numbers. Past impacts on threatened and endangered species in the region from human activities have been moderate and adverse.

Establishment of Gulf Islands National Seashore has resulted in long-term benefits for special status species. Protection provided by the national seashore will become increasingly important in providing quality habitat for rare species in the region. NPS programs such as monitoring and removal of exotic species continue to benefit animal, fish, and plant special status species. These are minor to moderate, long-term, beneficial impacts.

Disorientation from light pollution at Pensacola seems to cause some sea turtle hatchlings to head the wrong way after hatching, and they are being run over by vehicles on roads. Gravel and asphalt debris accumulating over the long term has an adverse effect on special status species, particularly turtles because they cannot dig through debris on the beach to lay eggs. These are minor to moderate, long-term, adverse impacts.

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on special status species may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of oil collected. These impacts may be minor to moderate in intensity.

Overall, the combined effects of these past, present, and future actions would be adverse and moderate in intensity.

The adverse effects of other past, present and future actions, combined with no new effects from actions proposed in this alternative, would have moderate adverse cumulative impacts. Alternative 1 would comprise a small contribution of adverse impacts to these cumulative impacts.

Conclusion

Implementing alternative 1 would not result in any changes to current situations or management that would affect sensitive species.

Cumulative effects would be adverse and moderate in intensity.

IMPACTS OF IMPLEMENTING ALTERNATIVE 2

Florida District Areas

Naval Live Oaks. Increased human use and activity under this alternative would add to the potential for mortalities of gopher tortoises by vehicles when crossing the service road to the maintenance facility.

A barrier may be installed to keep tortoises from crossing the roadway and being killed by vehicles. However, it would also fragment population dynamics by preventing migration to the west unless tortoise underpasses were installed. This alternative would have minor, long-term adverse impacts on the gopher tortoise, unless underpasses were constructed.

Perdido Key. The listed Perdido Key beach mouse, shorebirds, sea turtles, and other marine species may be present and could be affected by visitor use. Use at Johnson Beach and the eastern tip of island, especially at night, could create potential problems and would require monitoring. The presence of the road would continue to result in roadkills, resulting in minor, long-term, adverse impacts on wildlife. The Perdido Key beach mouse is now only found in the national seashore in the developed area at Johnson Beach, the eastern tip of island, and the larger dunes in the center of the island. Sea turtles use the beach at night, and the effect of artificial lighting has been shown to be adverse. The national seashore continues to study artificial lighting impacts on sea turtles and to implement lighting standards in the seashore and surrounding areas with the help of community partners. Unrestricted access at the eastern tip may be related to recent declines in Perdido Key beach mouse counts.

Removal of the road, following a destructive storm, would have beneficial impacts on listed species by reducing the level of use on the beach and lagoon. These actions would also create habitat without threats of automobile mortalities.

Implementation of the nonmotorized visitor opportunities zone would benefit marine species. Use restrictions on the eastern tip of Perdido Key would also benefit shorebirds and the Perdido Key beach mouse.

This alternative would have moderate, long-term, beneficial impacts on listed species in this area.

Fort Pickens. Removal of the road following a severe storm would reduce visitation along this island, resulting in minor, long-term, beneficial impacts. There has been a substantial decrease in shorebird and turtle mortalities based on comparative roadkill counts from when the road was reopened. This reduction is estimated at a 90% reduction in bird mortality. This alternative would have a minor, long-term, beneficial effect on listed species in this area.

Santa Rosa Island. Implementing this alternative would result in similar effects and determination as those described for Fort Pickens.

Mississippi District Areas

Davis Bayou. Increased activity would be unlikely to adversely affect special status species. The proposed restoration of habitat at Davis Bayou would be a potential minor to moderate, long-term, beneficial impact for several special status species.

Cat Island. Greater accessibility would most likely cause greater visitation; however, under this alternative, NPS staff would have greater controls to regulate access and overnight use through education via a permit system, which

would benefit management of sensitive species and habitat.

East and West Ship Islands. The bird nesting period of March through September would coincide with the most desirable period for overnight camping on West Ship Island. Also, sea turtles lay eggs on the beach during summer months. Incidental take could occasionally occur from camping activities in the following ways:

- Nests and eggs could be inadvertently stepped on.
- Nesting birds could be scared off, adversely affecting egg incubation or chick rearing.
- Kemp's Ridley, loggerhead, and leatherback sea turtles could also be impacted by the presence of campers.

Although NPS staff would have controls to regulate overnight use through a permit system, benefiting management of sensitive species, the presence of overnight campers could pose threats to these same species. These conditions would result in minor, long-term, adverse impacts.

Horn and Petit Bois Islands. NPS staff would have greater control to regulate overnight use through a permit system, which would benefit management of sensitive species. The nonmotorized primitive visitor opportunities zone would prevent motorized boats from accessing the islands in an unregulated manner, resulting in beneficial effects for sensitive species.

Cumulative Impacts

Overfishing, habitat loss, and degradation are the most common reasons for a wildlife or plant species to become threatened or endangered. Loss or fragmentation of habitat has occurred in the region around the national seashore as a result of commercial and residential development. Human-related land uses on private, state, and federal land have disrupted or fragmented terrestrial and marine habitat, displaced individuals, or otherwise caused stress to animals. Incremental development of the region has changed the quality and capacity of habitats, resulting in the decrease of population numbers. Past impacts on threatened and endangered species in the region from human activities have been moderate and adverse.

Establishment of Gulf Islands National Seashore has resulted in long-term benefits for special status species. Protection provided by the national seashore will become increasingly important in providing quality habitat for rare species in the region. NPS programs such as monitoring and removal of exotic species continue to benefit animal, fish, and plant special status species. These are minor to moderate, long-term, beneficial impacts.

Disorientation from light pollution at Pensacola seems to cause some sea turtle hatchlings to head the wrong way after hatching, and they are being run over by vehicles on roads. Gravel and asphalt debris accumulating over the long term has an adverse effect on special status species, particularly turtles because they cannot dig through debris on the beach to lay eggs. These are minor to moderate, long-term, adverse impacts.

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on special status species may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of oil collected. These impacts may be minor to moderate in intensity.

Overall, the combined effects of these past, present, and future actions would be adverse and moderate in intensity.

The adverse effects of other past, present, and future actions, combined with the adverse and beneficial impacts of alternative 2, would have moderate adverse cumulative impacts. Alter-

native 2 would comprise a modest beneficial contribution to these cumulative impacts.

Conclusion

Implementing alternative would have long-term, minor, adverse impacts on the gopher tortoise at Naval Live Oaks, the Perdido Key beach mouse near Johnson Beach, and nesting turtles on East and West Ship islands. Other federally listed species, including sea turtles, birds, and amphibians, would experience negligible or minor adverse impacts in general, but may benefit if certain roads or facilities are closed after a destructive storm. In some locations, additional protections for resources such as permitting of visitor use and seasonal habitat closures would lead to minor long-term benefits to listed species.

Cumulative effects would be adverse and moderate in intensity.

IMPACTS OF IMPLEMENTING ALTERNATIVE 3

Measures for migitation of the potential impacts of the action alternatives on federally listed species are detailed in the Migitative Measures section in Chapter 2.

Florida District Areas

Naval Live Oaks. Increased human use and activity under this alternative could increase the potential for mortalities (incidental *take*) of gopher tortoises by vehicles when crossing the service road to the maintenance facility. However, ongoing mitigation measures reduce the likelihood of mortality. The addition of underpasses would support population dynamics by allowing migration to the west. Overall, the activity at this location *may affect and is not likely to adversely affect* gopher tortoise.

Perdido Key. The listed Perdido Key beach mouse, shorebirds, sea turtles, and other marine species may be present and could be affected by visitor use. Use at Johnson Beach and the eastern tip of island, especially at night, could create potential problems and would require monitoring. The presence of the road would continue to result in occasional roadkills (incidental *take*), resulting in negligible to minor, long-term, adverse impacts on wildlife. However, ongoing mitigative measures for shorebird protection have proven to be effective, and receive annual review by the national seashore and wildlife management agency partners.

The Perdido Key beach mouse is now only found in the national seashore in the dunes near Johnson Beach, the eastern tip of island, and the larger dunes in the center of the island. Unrestricted access at the eastern tip might be related to recent declines in Perdido Key beach mouse counts. Therefore, the construction of a restroom at the eastern tip of the key that would direct visitors to one area, rather than visitors trampling beach mouse habitat, would benefit the listed beach mouse and their habitat. Additional mitigation of effects with specific management actions such as fencing could also reduce the impact on the beach mouse. Therefore, the preferred alternative *may affect and is not likely to adversely affect* the Perdido Key beach mouse due to the construction of a toilet facility and other mitigation measures.

Many species of sea turtles use the beach at night, and the effect of artificial lighting has been shown to be adverse. The national seashore continues to study artificial lighting impacts on sea turtles and to implement lighting standards in the seashore and surrounding areas with the help of community partners. This would equate to a *may affect, not likely to adversely affect* on sea turtles on in this area.

Due to their rare use of the area, West Indian manatee is *not likely to be adversely affected*.

Fort Pickens. Shorebirds, sea turtles and other marine species may be present and could be affected by visitor use. Though new effects are not anticipated, implementing this alternative would result in continued

negligible to minor effects, equating to a *may affect, not likely to adversely affect* determination for shorebirds and sea turtles in some locations.

Santa Rosa Island. Beach mouse, shorebirds, sea turtles, and other marine species such as West Indian manatee may be present and could be affected by visitor use. All mitigative measures described in Chapter 2 would continue. Though new effects are not anticipated, implementing this alternative would result in continued negligible to minor effects, equating to a *may affect, not likely to adversely affect* determination for shorebirds and sea turtles in some locations. Due to their rare use of the area, West Indian manatee is *unlikely to be adversely affected*.

Mississippi District Areas

Davis Bayou. Increased activity might occur under this alternative, but it would be unlikely to adversely affect special status species. The proposed restoration of habitat at Davis Bayou would create potential minor, long-term, *beneficial* impacts on bird species including Mississippi sandhill crane, wood stork, and West Indian manatee. This would equate to a *may affect, not likely to adversely affect* determination for these species.

Cat Island. Greater accessibility would most likely cause greater visitation; however, under this alternative, NPS staff would have greater controls to regulate access and overnight use through education via a permit system, which would benefit management of sensitive species. Greater development and accommodation for more frequent visitation and more people to this destination under this alternative would occur and would require further effort to ensure protection of sensitive species such as piping plover, which critical habitat on Cat Island. This would equate to a *may affect, not likely to adversely affect* determination for these species. West Indian manatees are not found along the Mississippi barrier islands, and *no effects are expected*.

East and West Ship Islands. The bird nesting period of March through September would coincide with the most desirable period for overnight camping. Sea turtles lay eggs on the beach also during summer months. Incidental take could occasionally occur from camping activities. However, the shorebird and sea turtle monitoring programs limit activities in sensitive areas during nesting seasons, so this alternative *may affect, but is not likely to adversely affect* sea turtles.

Greater development and accommodation for more frequent visitation and more people to this destination would occur under this alternative and would require further effort to ensure protection of sensitive species. These conditions could have a negligible to minor, long-term, adverse impact. This would equate to a *may affect, not likely to adversely affect* on nesting birds and sea turtles on East and West Ship islands. West Indian manatees are not found along the Mississippi barrier islands, and *no effects are expected*.

Horn and Petit Bois Islands. Under this alternative, NPS staff would have greater control to regulate overnight use through a permit system, which would benefit management for sensitive species. The nonmotorized primitive visitor opportunities zone would prevent motorized boats from accessing the islands in an unregulated manner, resulting in beneficial effects for sensitive species such as piping plover, which has critical habitat on these islands. This would equate to a *may affect, not likely to adversely affect* determination for these species. West Indian manatees are not found along the Mississippi barrier islands, and *no effects are expected*.

Cumulative Impacts

Overfishing, habitat loss, and degradation are the most common reasons for a wildlife or plant species to become threatened or endangered. Loss or fragmentation of habitat has occurred in the region around the national seashore as a result of commercial and residential development. Human-related land

uses on private, state, and federal land have disrupted or fragmented terrestrial and marine habitat, displaced individuals, or otherwise caused stress to animals. Incremental development of the region has changed the quality and capacity of habitats, resulting in the decrease of population numbers. Past impacts on threatened and endangered species in the region from human activities have been moderate and adverse.

Establishment of Gulf Islands National Seashore has resulted in long-term benefits for special status species. Protection provided by the national seashore will become increasingly important in providing quality habitat for rare species in the region. NPS programs such as monitoring and removal of exotic species continue to benefit animal, fish, and plant special status species. These are minor to moderate, long-term, beneficial impacts.

Disorientation from light pollution at Pensacola seems to cause some sea turtle hatchlings to head the wrong way after hatching, and they are being run over by vehicles on roads. Gravel and asphalt debris accumulating over the long term has an adverse effect on special status species, particularly turtles because they cannot dig through debris on the beach to lay eggs. These are minor to moderate, long-term, adverse impacts.

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on special status species may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of oil collected. These impacts may be minor to moderate in intensity.

Overall, the combined effects of these past, present, and future actions would be adverse and moderate in intensity.
The adverse effects of other past, present, and future actions, combined with the beneficial and adverse impacts of this alternative, would have moderate adverse cumulative impacts. Alternative 3 would comprise a modest beneficial and adverse contribution to these cumulative impacts.

Conclusion

Table 19 summarizes the determinations of effect on federally listed species under the Endangered Species Act. This table is included to help fulfill the National Park Service obligations under section 7 of the Endangered Species Act to complete species-specific determinations of effect of the actions of the preferred alternative.

Implementing alternative 3 would have long-term, minor, adverse impacts on the Perdido Key beach mouse near Johnson Beach. Other federally listed species, including shorebirds, gopher tortoise, sea turtles, and amphibians, would experience negligible to minor adverse impacts. However, in some locations, additional protections for resources such as permitting of visitor use and seasonal habitat closures would lead to minor long-term benefits to listed species.

Cumulative effects would be adverse and moderate in intensity.

Because the actions described in this alternative are general and conceptual, the impacts have been analyzed in general terms. If and when site-specific developments or other actions are proposed for implementation after the final *General Management Plan* is published and approved, appropriate and detailed consultation with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service will be conducted as required by the Endangered Species Act on a project-specific basis.

TABLE 19: SUMMARY OF FEDERALLY LISTED SPECIES DETERMINATIONS FOR THE PREFERRED ALTERNATIVE

Federally Listed Species[1]	Endangered Species Act Determination of Effect
Gulf Sturgeon	NE[2]
American Alligator	MA / NLAA[3]
Loggerhead Turtle	MA / NLAA
Green Sea Turtle	MA / NLAA
Leatherback Turtle	MA / NLAA
Eastern Indigo Snake	NE
Kemp's Ridley Sea Turtle	MA / NLAA
Gopher Tortoise	MA / NLAA
Dusky Gopher Frog	NE
Piping Plover	MA / NLAA
Mississippi Sandhill Crane	MA / NLAA
Wood Stork	MA / NLAA
Red-Cockaded Woodpecker	NE
Red Wolf	NE
Perdido Key Beach Mouse	MA / NLAA
West Indian Manatee	MA / NLAA
Florida Perforate Cladonia (Reindeer Lichen)	NE

1. See Table 9 in Chapter 3 for scientific names of these species.
2. No effect. Some species are included on this table because they are federally listed in the area, but the plan will have no effect (see Chapter 3, Special Status Species).
3. May affect, not likely to adversely affect.

IMPACTS OF IMPLEMENTING ALTERNATIVE 4

Florida District Areas

Naval Live Oaks. Increased human use and activity under this alternative would increase the potential for mortalities of gopher tortoises by vehicles when crossing the service road to the maintenance facility.

As mitigation, a barrier would be installed to keep tortoises from crossing the roadway and being killed by vehicles. However, it would also fragment population dynamics by preventing migration to the west unless tortoise underpasses were installed. This alternative would have minor, long-term adverse impacts on the gopher tortoise, unless underpasses were constructed.

Perdido Key. The listed Perdido Key beach mouse, shorebirds, sea turtles, and other marine species might be present and could be affected by visitor use. Use at Johnson Beach and the eastern tip of island, especially at night, could create potential problems and would require monitoring. The presence of the road would continue to cause roadkills, resulting in minor, long-term, adverse impacts on wildlife. The Perdido Key beach mouse is now only found in the national seashore park in the developed area at Johnson Beach, the eastern tip of island, and the larger dunes in the center of the island. Sea turtles use the beach at night, and the effect of artificial lighting might be adverse, but this needs additional study.

An increased footprint at Johnson Beach, including new facilities and a new 0.5-mile-long trail and associated activities, could affect mice and Perdido Key beach mouse habitat. However, the construction of a restroom facility would reduce visitors trampling the beach mouse habitat in the area, leading to long-term benefits.

Use restrictions employed at the eastern tip of the island would provide minor, long-term, beneficial effects for shorebirds and Perdido Key beach mouse. Overall, this alternative would have negligible to minor, long-term adverse impacts on listed species in this area.

Fort Pickens. Shorebirds, sea turtles, and other marine species might be present and could be affected by visitor use.

Implementing this alternative would not result in any change that would affect sensitive species.

Santa Rosa Island. Beach mouse, shorebirds, sea turtles, and other marine species might be present and could be affected by visitor use.

Implementing this alternative would not result in any change that would affect sensitive species.

Mississippi District Areas

Davis Bayou. Increased activity would be unlikely to adversely affect special status species. Construction of a multiuse trail would be a minor, long-term, adverse impact on wildlife habitat. However, the proposed restoration of habitat at Davis Bayou would be a potential minor to moderate, long-term, beneficial impact for several special status species.

Cat Island. Although there are more man-made impacts on Cat Island, this island also provides the most diverse habitat types compared to any other area of the entire national seashore. Alternative 4 provides the greatest level of accessibility to this destination and therefore would require the greatest level of effort to ensure adequate protection of sensitive species. The combination of increased visitation coupled with the potential for boat and buggy rentals would provide visitors with almost unimpeded access to all areas of the island. This action would result in moderate, long-term, adverse impacts on sensitive species.

East and West Ship Islands. Alternative 4 provides the greatest level of accessibility to this destination and therefore would require the greatest level of effort to ensure adequate protection of sensitive species. The bird nesting period of March through September would coincide with the most desirable period for overnight camping on the islands. Sea turtles lay eggs on the beach also during the summers. Incidental take could occasionally occur from camping activities.

Although NPS staff would have controls to regulate overnight use through a permit system, benefiting management of sensitive species, the presence of overnight campers could pose threats to these same species. These conditions would have a minor, long-term, adverse impact.

Horn and Petit Bois Islands. NPS staff would have control to regulate overnight use through a permit system, which would benefit management for sensitive species. The non-motorized primitive visitor opportunities zone would prevent motorized boats from accessing the islands in an unregulated manner, resulting in beneficial effects for sensitive species.

Cumulative Impacts

Overfishing, habitat loss, and degradation are the most common reasons for a wildlife or plant species to become threatened or endangered. Loss or fragmentation of habitat has occurred in the region around the national seashore as a result of commercial and residential development. Human-related land uses on private, state, and federal land have disrupted or fragmented terrestrial and marine habitat, displaced individuals, or otherwise caused stress to animals. Incremental development of the region has changed the quality and capacity of habitats, resulting in the decrease of population numbers. Past impacts on threatened and endangered species in the region from human activities have been moderate and adverse.

Establishment of Gulf Islands National Seashore has resulted in long-term benefits for special status species. Protection provided by the national seashore will become increasingly important in providing quality habitat for rare species in the region. NPS programs such as monitoring and removal of exotic species continue to benefit animal, fish, and plant special status species. These are minor to moderate, long-term, beneficial impacts.

Disorientation from light pollution at Pensacola seems to cause some sea turtle hatchlings to head the wrong way after hatching, and they are being run over by vehicles on roads. Gravel and asphalt debris accumulating over the long term has an adverse effect on special status species, particularly turtles because they cannot dig through debris on the beach to lay eggs. These

are minor to moderate, long-term, adverse impacts.

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on special status species may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of oil collected. These impacts may be minor to moderate in intensity.

Overall, the combined effects of these past, present, and future actions would be adverse and moderate in intensity.

The adverse effects of other past, present, and future actions, combined with the beneficial and adverse effects of this alternative, would result in moderate adverse cumulative impacts. Alternative 4 would comprise a modest beneficial and adverse contribution to these cumulative impacts.

Conclusion

Implementing alternative would have long-term, minor, adverse impacts on the gopher tortoise at Naval Live Oaks, the Perdido Key beach mouse near Johnson Beach, and nesting turtles on East and West Ship islands. Other federally listed species, including sea turtles, birds, and amphibians, would be subject to negligible or minor adverse impacts. However, in some locations, additional protections for resources such as permitting of visitor use and seasonal habitat closures would lead to minor long-term benefits to listed species.

Cumulative effects would be adverse and moderate in intensity.

IMPACTS ON VISITOR USE AND EXPERIENCE

METHODS AND ASSUMPTIONS FOR ANALYZING IMPACTS

NPS *Management Policies 2006* state that enjoyment of park [national seashore] resources and values by the people of the United States is part of the fundamental purpose of all parks, and that the National Park Service is committed to providing appropriate, high-quality opportunities for visitors to enjoy parks. Anticipated impacts on visitor use and experience were analyzed using baseline information from current operations. Impacts were evaluated comparatively between alternatives, using alternative A, the no-action alternative, as a baseline for comparison with each action alternative.

In this section, impacts are analyzed across all units because of the similarities of visitor use and effect of the alternatives. This impact analysis considers various aspects of visitor use and experience at Gulf Islands National Seashore, including the effects on the visitor's ability to access areas of the national seashore, the visitor's ability to participate in a diverse range of national seashore recreation opportunities, and visitor safety.

Definitions of Intensity Levels

Negligible: Visitors would likely be unaware of any effects associated with implementation of the alternative.

Minor: Changes in visitor use and/or experience would be slight but detectable, would affect few visitors, and would not appreciably limit or enhance experiences identified as fundamental to the national seashore's purpose and significance.

Moderate: Some characteristics of visitor use and/or experience would change, and many visitors would likely be aware of the effects associated with implementation of the alternative; some changes to experiences identified as fundamental to the national seashore's purpose and significance would be apparent.

Major: Multiple characteristics of visitor experience would change, including experiences identified as fundamental to the national seashore's purpose and significance; most visitors would be aware of the effects associated with implementation of the alternative.

Type of Impact

Adverse impacts are those that most visitors participating in the affected activity would perceive as undesirable. Beneficial impacts are those that most visitors would perceive as desirable.

IMPACTS OF IMPLEMENTING ALTERNATIVE 1

Analysis

The public roads in the national seashore would provide visitors with access to a variety of lifeguarded and unguarded beaches, picnic areas, day use areas, and stretches of white sand beaches. Visitors would continue to be provided with access to national seashore sites that provide a comprehensive variety of recreational and interpretive opportunities — such as Johnson Beach, Fort Pickens, Opal Beach, Naval Live Oaks, and Okaloosa in the Florida District and Davis Bayou and West Ship Island in the Mississippi District. The Naval Live Oaks, Davis Bayou, Fort Pickens, and Naval Air Station Historic Sites areas have visitor centers that vary in size and number of programs. The only location where RV and personal vehicle camping are permitted would continue to be at the Fort Pickens and Davis Bayou Areas. Overnight, primitive camping for individuals is not allowed in the Naval Live Oaks, Santa Rosa, Okaloosa, and West Ship Island areas. Group camping facilities would continue to be designated for a specific group

and function. The national seashore visitors would continue to have access to various recreational opportunities into the future and that would continue to have a negligible beneficial long-term impact on the visitor use and experience. Hurricanes could routinely damage national seashore roads and facilities and begin to limit visitor opportunities as demonstrated in 2004 and 2005.

There would continue to be no alternative land or water transportation systems supporting the areas in the Florida District, and only one passenger ferry would provide visitor access from Gulfport, Mississippi, to West and East Ship islands in the Mississippi District. Continuing the current reliance on roads and one passenger ferry in the Mississippi District would likely continue to have a minor to moderate, long-term, adverse impact on the visitor experience because crowding would continue and NPS facilities and parking would not be expanded to accommodate the rise in visitation. In addition, the current transportation system would continue to limit visitor access between areas in the national seashore.

As the natural coastline of the northern Gulf Coast continues to be developed, the natural resources of the national seashore will become even more important for researchers as a baseline to monitor land use and resource decisions. The growing demand for environmental education programs cannot be accommodated with current staffing levels and the lack of facilities. There would continue to be a minor, long-term, adverse impact on the visitor experience from not expanding staffing, resource monitoring programs, and school programs, and not providing facilities for environmental education and research.

Opportunities would continue to be provided for visitors to explore the historic sites and structures, including the defense fortifications, in the national seashore. Most sites currently allow visitors to explore the structures but have very little furnishings and few interpretive signs that support self-discovery and understanding of the historic events and functions of these resources. Self-guiding brochures would continue to be used as major interpretive tools. There would continue to be no visitor access or interpretive program in the lighthouse complex in the Naval Air Station Historic Sites Area. The current programs would continue to rely mostly on scheduled interpretive talks, brochures, and self-discovery. The current programs would continue to have a negligible, long-term beneficial impact on the visitor use and experience into the future.

The Okaloosa Area would continue to provide day-use access to safe swimming. A small boat launch would continue to be provided in addition to the small bathhouse and interpretive signs. This area is in the community of Fort Walton Beach and has limited NPS presence and programs. The current visitor opportunities would continue to have a negligible, long-term impact on the visitor experience. The lack of a ranger presence here would have a minor, long-term, adverse impact on the visitor experience and safety as the population continues to grow at Fort Walton Beach.

Boaters would continue to have very few restrictions to access and anchor near the beaches of the barrier islands. The only formal or designated boat access to land would continue to be small boat launches (mainly for small boats, kayaks, and canoes) at the Johnson Beach, Davis Bayou, and Okaloosa Areas. Private boaters would continue to be allowed to temporally tie-up to load and unload at the NPS docking facility on West Ship Island. Boaters could continue to access and anchor on all shores of the wilderness islands of Petit Bois and Horn. Motors and generators from the boats would continue to be intrusive on the wilderness values. The boating public would continue to have a lot of freedom within the national seashore. Boaters could continue to anchor away from others or raft together for group gatherings. The current management directions provide boaters freedom to anchor at and access most areas of the national seashore, but as the boating population grows there would be fewer opportunities for boaters to find

solitude or group gathering spaces. This could have a moderate, long-term, adverse impact on the visitor experience.

Cat Island would continue to provide visitors with a primitive, backcountry experience on lands managed by the national seashore. There would continue to be no permit system to manage camping opportunities and visitor congestion. There would continue to be no facilities to support visitor use and minimize impacts caused by water and land access and human waste. Given the current level of visitor use, there would continue to be a negligible level of impact on the visitor experience. Over time, Cat Island may grow in popularity, and the opportunities for backcountry solitude could be reduced during peak visitor use periods. In addition, the lack of facilities would continue to create a situation where evidence of previous visitors is easily found and might be unpleasant. These things would continue to result in minor to moderate, long-term, adverse impacts on visitor use and experience.

Overall, impacts on the visitor use and experience from implementing alternative 1 would continue to be minor to moderate, long term, and adverse.

Cumulative Impacts

The national seashore would continue to be a destination primarily for local and regional visitors to the Gulf Coast. The white sandy beaches within a natural, undeveloped setting contrasts with the developed coastal communities of Florida, Alabama, and Mississippi. The national seashore would continue to preserve the natural setting and recreational opportunities. In context with the outdoor recreation and conservation activities provided by the Florida Department of Environmental Protection, Division of Recreation and Parks; Mississippi Department of Wildlife, Fisheries and Parks; the Naval Air Station, Pensacola Complex; Eglin Air Force Base; and various county and city recreational departments, a substantial area would continue to be provided where visitors (civilian or military) could continue to choose from a range of outdoor recreational opportunities and access historic resources of the region.

The communities of Perdido Key, Pensacola, Gulf Breeze, Pensacola Beach, Florida, and Ocean Springs and Gulfport, Mississippi, would continue to provide information and tourism-related services to visitors entering the national seashore. The actions of these communities and those of the national seashore staff would continue to influence the visitor experience—especially in relation to access and traffic considerations.

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on visitor use and experience may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of oil collected. These impacts may be minor to moderate in intensity.

The University of West Florida and the Gulf Coast Research Laboratory of the University of Southern Mississippi support education and research opportunities that could contribute to visitor use and experience, especially through programs that occur in and near the national seashore.

The National Naval Aviation Museum is a major attraction that helps contribute to a critical mass of activities within the area of historic defense fortifications managed by the National Park Service. This provides visitors with a variety of choices to fill their day in this area of Pensacola, Florida.

Overall, the impacts of other past, present, and reasonably foreseeable actions just described would be long-term, moderate, and beneficial.

The impacts of alternative 1 actions on the visitor use and experience, combined with the actions of other past, present, and reasonably foreseeable actions of others, would have a minor, long-term, adverse cumulative impact on the diversity of recreation and educational opportunities. The contribution of alternative 1 to these cumulative impacts would be minimal.

Conclusion

The national seashore would continue to provide a variety of recreational and educational opportunities. These opportunities would continue to rely primarily on vehicle access to many of the areas in the Florida District and private boat access and one passenger ferry to access the areas in the Mississippi District. The continued dependence on these facilities and roads to provide for the variety of recreational opportunities could have a minor to moderate beneficial impact on the visitor use and experience unless the facilities periodically are impacted by hurricanes, which can dramatically influence visitor access and experience.

Many areas of the national seashore are just beginning to feel the pressures of crowding and the resource impacts on seagrass beds and the wilderness values of Petit Bois and Horn islands. Overall, impacts on the visitor use and experience from implementing alternative 1 would be minor to moderate, long-term, and adverse.

The cumulative impacts on the visitor use and experience would be minor, long-term, and adverse. The contribution of alternative 1 to these cumulative impacts would be minimal.

IMPACTS OF IMPLEMENTING ALTERNATIVE 2

Analysis

Alternative 2 would emphasize the more primitive recreational opportunities within the national seashore. If a hurricane or major storm substantially destroys roads and/or facilities, they would not be replaced on the barrier islands. In this case, road debris may cause minor, long-term adverse impacts on visitor experience. Backcountry recreational opportunities would be more prominent throughout the national seashore. This alternative would have a moderate, long-term beneficial impact on visitors who are looking for recreational opportunities within a wild seashore setting with greater opportunities for self-discovery and testing their outdoor skills. The interpretive and educational opportunities could focus on more on self-discovery, stewardship, and educational programs focused on natural resources.

This alternative would also significantly alter the current recreational opportunities at popular areas of the national seashore—such as the Fort Pickens, Santa Rosa, Perdido Key, and West Ship Island areas. Personal vehicle access would be eliminated when roads were not replaced once substantially destroyed by a storm. The lack of vehicle access at many of the NPS areas would eliminate visitor opportunities, services, and facilities that are available today—such as car or RV camping; the ability to easily haul recreational equipment; motorized access to more areas of the national seashore for shoreline fishing; and other seashore recreational activities. With most of West and East Ship islands being managed for primitive nonmotorized recreational opportunities, visitor services would be provided off-site or from the concessioner boat. It would be expected that as more of the national seashore provides primitive recreational opportunities, there could be a decline in the number of visitors. These effects would have a moderate, long-term, adverse impact on visitors who prefer the current variety of recreational opportunities and access.

Alternative 2 encourages additional water-based transportation service to the Fort Pickens Historic District from locations around Pensacola Bay and to add temporary boat tie-ups; both actions could provide a new and welcoming visitor experience. The historic resources and visitor access to recreational beaches would be maintained and accessible at NPS sites near and within the historic district. These actions could have a moderate, long-term, beneficial impact on the visitor experience at this national seashore area.

At Cat Island, the national seashore lands would continue to be managed for primitive backcountry opportunities and overnight camping. In alternative 2, a permit system to manage overnight camping would be implemented and might result in assigning designated campsites. If so, this might limit visitor campsite choices and thus have minor, long-term, adverse impact on visitor experiences.

Alternative 2 includes the following new opportunities at NPS sites that could have a minor to moderate, long-term, beneficial impacts on the visitor experience.

- At Naval Live Oaks the group camping facility would be made available to a broad range of organized groups.
- New boat docks at the visitor center would enhance safe access to the Naval Live Oaks site by water.
- The visitor experience at the Naval Air Station Historic Sites Area would be enhanced by providing access and interpretation to the lighthouse complex.
- New visitor facilities and parking would enhance activities at the national seashore boundary with the community of Pensacola Beach.
- Based on a future commercial use feasibility study, there could be opportunities for visitors to access the Mississippi barrier islands from the Davis Bayou Area. This action would provide increased access for visitors who currently do not have access to water transportation.

There could be minor to moderate, long-term, adverse impact on the boating public because of new restrictions in areas managed to protect the seagrass beds.

These same restrictions could also increase protection of the wilderness values such as solitude, the natural soundscape, and views on Horn and Petite Bois islands, resulting in a minor to moderate, long-term, beneficial impact.

Overall, impacts on the visitor use and experience from implementing alternative 2 would be moderate, long-term, and adverse.

Cumulative Impacts

The national seashore would continue to be a destination primarily for local and regional visitors to the Gulf Coast. The white sandy beaches within a natural, undeveloped setting contrasts with the developed coastal communities of Florida, Alabama, and Mississippi. The national seashore would continue to preserve the natural setting and recreational opportunities. In context with the outdoor recreation and conservation activities provided by the Florida Department of Environmental Protection, Division of Recreation and Parks; Mississippi Department of Wildlife, Fisheries and Parks; the Naval Air Station, Pensacola Complex; and Eglin Air Force Base; and various county and city recreational departments, a substantial area would continue to be provided where visitors (civilian or military) could continue to choose from a range of outdoor recreational opportunities and access historic resources of the region.

The communities of Perdido Key, Pensacola, Gulf Breeze, Pensacola Beach, Florida, and Ocean Springs and Gulfport, Mississippi, would continue to provide information and tourism-related services to visitors entering the national seashore. The actions of these communities and those of the national

seashore staff would continue to influence the visitor experience—especially in relation to access and traffic considerations.

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on visitor use and experience may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of oil collected. These impacts may be minor to moderate in intensity.

The University of West Florida and the Gulf Coast Research Laboratory of the University of Southern Mississippi support education and research opportunities that could contribute to visitor use and experience, especially through programs that occur in and near the national seashore.

The National Naval Aviation Museum is a major attraction that helps contribute to a critical mass of activities within the area of historic defense fortifications managed by the National Park Service. This provides visitors with a variety of choices to fill their day in this area of Pensacola, Florida.

Overall, the impacts of other past, present, and reasonably foreseeable actions just described would be long-term, moderate, and beneficial.

The impacts of alternative 2 actions on visitor use and experience, combined with the other past, presence, and reasonably foreseeable actions by others, would have a moderate, long-term adverse cumulative impact on the diversity of recreational opportunities that are available to visitors at Pensacola Beach, Gulf Breeze, and Perdido Key. The lack of roads in the Fort Pickens, Santa Rosa, and Perdido Key areas would create more primitive back-country recreational opportunities rather than a diversity of opportunities. Visitors looking for car camping and RV camping would place greater demand on an already limited supply within the parks of northwest Florida. This action could affect the visitor experience for local residents and tourists who access the national seashore from these gateway communities. The contribution of alternative 2 to these cumulative impacts would be noticeable.

Conclusion

Alternative 2 could change the visitor experience to a more primitive type of recreational opportunities and thereby have a moderate, long-term, adverse impact on visitors who prefer the current variety of recreational opportunities and access and levels of use. However, this could have a minor beneficial impact on visitors wanting solitude and more primitive types of experiences.

Access to new recreational opportunities that include the lighthouse complex in the Naval Air Station, new visitor facilities at the national seashore entrance on the border of Pensacola Beach, and docks at the Naval Live Oaks could have a minor to moderate, long-term, beneficial impact on the visitor experience.

There could be moderate, long-term, adverse impacts on the boating public with new restrictions in areas managed to protect seagrass beds on the north side of the barrier islands.

Overall, impacts on visitor use and experience from implementing alternative 2 would be moderate, long-term, and adverse.

The cumulative impacts on the visitor use and experience would be minor to moderate, long-term, and adverse. The contribution of alternative 2 to these cumulative impacts would be noticeable.

IMPACTS OF IMPLEMENTING ALTERNATIVE 3

Analysis

Alternative 3 would emphasize the opportunities for visitors to learn about and explore the natural and historic resources of the national seashore. This alternative would provide more programs and visitor opportunities for educational, interpretive, and stewardship activities. The national seashore's historic structures and defense fortifications would be enhanced and furnished to help visitors explore the period of historic significance and learn about the stories and events. Environmental education and research centers at Naval Live Oaks and Davis Bayou would support a variety of outdoor education and stewardship activities to provide visitors an opportunity to learn about and participate in caring for the natural resources of the national seashore. To further support the education and interpretive concept, a mobile interpretive vehicle would be used throughout the national seashore where vehicle access is available. Modest educational facilities would be provided on Cat Island.

Existing campgrounds at Naval Live Oaks, Fort Pickens, and Davis Bayou, and permitted camping for group education programs at Santa Rosa could support educational and stewardship activities. The increased emphasis and number of facilities to support the education, interpretation, and stewardship activities for visitors could have a moderate, long-term, beneficial impact on the visitor use and experience at the national seashore.

If substantially destroyed by storms, vehicle access to Perdido Key would be replaced with a multiuse trail beyond Johnson Beach. This action could have a minor to moderate, long-term, adverse impact on visitors who enjoy vehicle access to more sections of the beach within the Perdido Key Area of the national seashore. Also, road debris may cause minor, long-term adverse impacts on visitor experience. The new trail could have a minor to moderate, long-term, beneficial impact on visitors seeking challenging and primitive recreational opportunities.

New boat docks at Naval Live Oaks and the dispersal of visitors in Fort Pickens and on other barrier islands would enhance visitor access to these NPS sites from the water. Areas that provide designated tent camping would support visitors who arrive by alternative transportation. These new boating and camping opportunities could have a minor, long-term, beneficial impact on visitor use and experience.

Recreational opportunities could be enhanced with the following proposed actions:

- allowing overnight camping opportunities on West Ship Island
- possibly expanding parking at Fort Pickens
- increasing NPS programs and presence at Okaloosa

These actions could have a moderate, long-term, beneficial impact on visitor use and experience.

Cat Island would continue to be managed for backcountry opportunities that include permitted overnight primitive camping. In addition to self-discovery, programs and modest facilities would be provided that support the educational and stewardship activities at this location and could provide a minor to moderate, long-term, beneficial impact on the visitor use and experience.

There could be minor to moderate, long-term, adverse impact on the boating public because of new restrictions in areas managed to protect the seagrass beds.

These same restrictions could also increase protection of the wilderness values such as solitude, the natural soundscape, and views on Horn and Petite Bois islands, resulting in a minor to moderate, long-term, beneficial impact on visitor experiences.

Overall, impacts on the visitor use and experience from implementing alternative 3 would be minor to moderate, long-term, and beneficial.

Cumulative Impacts

The national seashore would continue to be a destination primarily for local and regional visitors to the Gulf Coast. The white sandy beaches within a natural, undeveloped setting contrasts with the developed coastal communities of Florida, Alabama, and Mississippi. The national seashore would continue to preserve the natural setting and recreational opportunities. In context with the outdoor recreation and conservation activities provided by the Florida Department of Environmental Protection, Division of Recreation and Parks; Mississippi Department of Wildlife, Fisheries and Parks; the Naval Air Station, Pensacola Complex; and Eglin Air Force Base; and various county and city recreational departments, a substantial area would continue to be provided where visitors (civilian or military) could continue to choose from a range of outdoor recreational opportunities and access historic resources of the region.

The communities of Perdido Key, Pensacola, Gulf Breeze, Pensacola Beach, Florida, and Ocean Springs and Gulfport, Mississippi, would continue to provide information and tourism-related services to visitors entering the national seashore. The actions of these communities and those of the national seashore staff would continue to influence the visitor experience—especially in relation to access and traffic considerations.

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on visitor use and experience may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of oil collected. These impacts may be minor to moderate in intensity.

The University of West Florida and the Gulf Coast Research Laboratory of the University of Southern Mississippi support education and research opportunities that could contribute to visitor use and experience, especially through programs that occur in and near the national seashore.

The National Naval Aviation Museum is a major attraction that helps contribute to a critical mass of activities within the area of historic defense fortifications managed by the National Park Service. This provides visitors with a variety of choices to fill their day in this area of Pensacola, Florida.

Overall, the impacts of other past, present, and reasonably foreseeable actions just described would be long-term, moderate, and beneficial.

The impacts of alternative 3 actions on the visitor use and experience, combined with other past, present, and reasonably foreseeable actions by others, could have a minor to moderate, long-term, beneficial cumulative impact on the diversity of recreational opportunities that are available to visitors at Pensacola Beach, Gulf Breeze, and Perdido Key. Also, a partnership with education and research institutions could create greater visitor opportunities to learn about and enjoy the natural and historic resources of the national seashore through stronger education and stewardship activities. This action could affect the visitor experience for local residents and tourists who access the national seashore from these gateway communities. The contribution of alternative 3 to these cumulative impacts would be noticeable.

Conclusion

Alternative 3 could provide a moderate, long-term, beneficial impact on the visitor use and experience by increasing opportunities for visitor access to education, interpretation, and

stewardship programs that explore the natural and historic resources of the national seashore, including new environmental education and research centers at the Naval Live Oaks and Davis Bayou Areas.

Recreational opportunities would be enhanced by providing new alternative land and water transportation; improved and new access and support facilities at additional beach locations at the Naval Live Oaks, Santa Rosa, and Fort Pickens Areas; overnight camping on West Ship Island; designated group camping that supports education and stewardship activities at Cat Island and other areas in the Florida District; and an increase NPS programs and presence at the Okaloosa Area. These actions could have a moderate, long-term, beneficial impact.

The possible decrease in vehicle access on Perdido Key, and the new restrictions in areas where seagrass beds would be managed and protected, could have minor to moderate, long-term, adverse impacts on the visitor use and experience of boaters.

There would be a minor to moderate, long-term, adverse impact on the boating public because of new restrictions to protect seagrass beds.

Overall, impacts on the visitor use and experience from implementing alternative 3 would be minor to moderate, long-term, and beneficial.

The cumulative impacts on the visitor experience would be a minor to moderate, long-term, and beneficial. The contribution of alternative 3 to the cumulative impacts would be noticeable.

IMPACTS OF IMPLEMENTING ALTERNATIVE 4

Analysis

Alternative 4 would enhance visitor opportunities and access to the national seashore. By expanding alternative land and water transportation key departure locations and retaining the existing public roads, visitors could have more opportunities to access historic sites and the barrier islands. In providing on-site equipment rentals and concession services where appropriate, visitors could have greater choices of recreational and educational activities and opportunities in exploring and enjoying the resources of the national seashore. Potential locations for equipment rentals could be at the Perdido Key, Fort Pickens, Santa Rosa, Okaloosa, Davis Bayou, and West Ship Island areas. These actions could have a moderate to major, long-term, beneficial impacts on the visitor use and experience at the national seashore.

Increased visitor interpretation and education would be provided by establishing visitor contact stations; providing for guided tours throughout the national seashore; establishing an environmental education/research center at the Fort Pickens Area; and encouraging water access between the Naval Air Station Historic Sites Area and the Fort Pickens Area to enhance visitor understanding of the defense fortification alignment within Pensacola Bay and to provide alternative, water-based, transportation. These actions could have a moderate to major, long-term, beneficial impact on the visitor use and experience.

Additional recreational opportunities would be provided by increasing access to national seashore beaches (including dune walkover and visitor support facilities) at the Perdido Key, Fort Pickens and Santa Rosa Areas; marked canoe and kayak trails; expanded bike and multipurpose trails; boater access at small designated boat docks; and permitted overnight primitive camping opportunities in the Santa Rosa, Perdido Key, Naval Live Oaks, and West Ship Island areas. These actions could have a moderate to major, long-term, beneficial impact on the visitor use and experience.

Cat Island would be managed to provide dispersed primitive backcountry opportunities for visitors. Permitted and designated

overnight camping would be available. Visitor access to trails and improved boat docks for temporary tie-ups to load and unload would be provided and have a moderate, long-term, beneficial impact on the visitor use and experience at the island.

A fee collection program could be based at the Okaloosa Area that would support increased visitor opportunities and programs. This could include expanding the boat launch, support facilities for swimming and picnicking, and a permanent visitor contact station at this location. These actions would have a moderate, long-term, beneficial impact on visitor use and experience and public safety. It could also have a moderate, long-term, adverse impact on visitors who have traditionally used the site and are satisfied with the existing free access and recreational opportunities.

There could be a minor to moderate, long-term, adverse impact on the boating public because of new restrictions in areas managed to protect the seagrass beds.

These same restrictions could also increase protection of the wilderness values such as solitude, the natural soundscape, and views on Horn and Petite Bois islands, resulting in a minor to moderate, long-term, beneficial impact.

Overall, impacts on the visitor use and experience from implementing alternative 4 would be moderate, long-term, and beneficial.

Cumulative Impacts

The national seashore would continue to be a destination primarily for local and regional visitors to the Gulf Coast. The white sandy beaches within a natural, undeveloped setting contrasts with the developed coastal communities of Florida, Alabama, and Mississippi. The national seashore would continue to preserve the natural setting and recreational opportunities. In context with the outdoor recreation and conservation activities provided by the Florida Department of Environmental Protection, Division of Recreation and Parks; Mississippi Department of Wildlife, Fisheries and Parks; the Naval Air Station, Pensacola Complex; and Eglin Air Force Base; and various county and city recreational departments, a substantial area would continue to be provided where visitors (civilian or military) could continue to choose from a range of outdoor recreational opportunities and access historic resources of the region.

The communities of Perdido Key, Pensacola, Gulf Breeze, Pensacola Beach, Florida, and Ocean Springs and Gulfport, Mississippi, would continue to provide information and tourism-related services to visitors entering the national seashore. The actions of these communities and those of the national seashore staff would continue to influence the visitor experience—especially in relation to access and traffic considerations.

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on visitor use and experience may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of oil collected. These impacts may be minor to moderate in intensity.

The University of West Florida and the Gulf Coast Research Laboratory of the University of Southern Mississippi support education and research opportunities that could contribute to visitor use and experience, especially through programs that occur in and near the national seashore.

The National Naval Aviation Museum is a major attraction that helps contribute to a critical mass of activities within the area of historic defense fortifications managed by the National Park Service. This provides visitors with a variety of choices to fill their day in this area of Pensacola, Florida.

Overall, the impacts of other past, present, and reasonably foreseeable actions just described would be long-term, moderate, and beneficial.

The impacts of alternative 4 actions on the visitor use and experience, combined with other past, present, and reasonably foreseeable actions by others, would have a moderate long-term beneficial cumulative impact on the diversity of recreational opportunities that are available to visitors from all gateway communities of the national seashore. Visitors could have improved access from major entry areas to various areas of the national seashore using new land and water shuttle services. In addition to a greater diversity of recreational opportunities, these transportation services could decrease the amount of vehicular traffic congestion within the gateway communities and provide visitors with a new visitor experience in getting to the national seashore. The contribution of alternative 4 to these cumulative impacts would be substantial.

Conclusion

Alternative 4 would enhance visitor opportunities and access to the national seashore through expanded land and water transportation; retention of existing public roads; new on-site equipment rentals and concession services where appropriate; expanded recreational and educational opportunities; increased programs and NPS presence at the Okaloosa Area; additional multipurpose trails, marked kayak and canoe trails; additional access areas to seashore beaches; an environmental education/research program at the Fort Pickens Area; and more overnight camping opportunities at new locations on the barrier islands. These recreational and educational opportunities would have a moderate to major, long-term, beneficial impact on visitor use and experience.

The Okaloosa Area could become a fee collection area that could change the historic use patterns of the site and have a moderate, long-term, adverse impact on visitors who enjoyed the historic uses and free access to the site. However, fee collection would have a moderate, long-term beneficial impact because some monies would be used to provide more visitor facilities and programs at this NPS site.

There would be a minor to moderate, long-term, adverse impact on the boating public because of new restrictions to protect seagrass beds.

Overall, impacts on the visitor use and experience from implementing alternative 4 would be moderate, long-term, and beneficial.

The cumulative impacts on the visitor experience would be a moderate, long-term, beneficial impact because of the diversity of recreational opportunities that would be available to visitors from all gateway communities of the national seashore. Visitors would have improved access because of the new land and water shuttle services. The contribution of alternative 4 to these cumulative impacts would be substantial.

IMPACTS ON THE SOCIAL AND ECONOMIC ENVIRONMENT

METHODS AND ASSUMPTIONS FOR ANALYZING IMPACTS

The National Park Service applied logic, experience, and professional expertise and judgment to analyze the impacts on the social and economic situation that would result from implementation of each alternative. Economic data, expected future visitor use, and future developments of the national seashore were all considered in identifying, discussing, and evaluating expected impacts.

Definitions of Intensity Levels

Negligible: Effects on social and economic conditions would be at the lowest level of detection, barely perceptible, and not easily measured.
Minor: Effects on social and economic conditions would be slight but detectable.
Moderate: Effects on social and economic conditions would be readily apparent and result in changes to social and economic conditions on a local scale.
Major: Effects on social and economic conditions would be readily apparent, resulting in demonstrable changes in social and economic conditions in the region.

Type of Impact

With respect to economic and social effects, few standards or clear definitions exist as to what constitutes adverse or negative changes. For example, rising unemployment is generally perceived as adverse, while increases in job opportunities and average per capita personal income are regarded as beneficial. In many instances, however, changes viewed as favorable by some members of a community are seen as unfavorable by others. For example, the impact of growth on housing markets and values may be seen as favorable by construction contractors and many homeowners, but adverse by renters and by local government officials and community groups concerned with affordability. Consequently, some of the social and economic impacts of the alternatives may allow the individual reviewer to determine whether they would be beneficial or adverse.

IMPACTS OF IMPLEMENTING ALTERNATIVE 1

Analysis

All areas of the national seashore continue to provide the recreational and interpretive opportunities that are available today. Davis Bayou, Naval Live Oaks, and Perdido Key provide open spaces and access to natural and cultural resources while being surrounded by urban growth. These important open spaces would continue to provide recreational opportunities to area residents and have a minor, long-term, beneficial impact.

At the Okaloosa Area, the local community could continue to enjoy public access to the waterfront for swimming and other beach recreational opportunities within this very congested and developing area. Unlawful acts and the safety of visitors and residents are concerns in this high density area. NPS on-site presence would continue to be minimal, and this could continue to result in minor, long-term, adverse impacts on the local community.

There is no alternative land shuttle or water transportation in much of the national seashore. As traffic congestion continues to grow, there could be a minor to moderate, long-term, adverse impact on circulation and access for residents in the local communities near the national seashore.

There is limited boat access to the Mississippi barrier islands. Generally, boating to the islands is becoming more expensive for boaters. Alternative 1 does not address

affordable water transportation to the barrier islands except for the current passenger ferry to West and East Ship islands. The limited water transportation to the barrier islands could continue to have a minor, long-term, adverse impact on local and regional boaters.

The passenger ferry to West and East Ship islands would continue to operate as it does today. This includes providing on-site food and equipment rental services along the boardwalk corridor. Although this is a benefit to the visitor, continuing these services would continue to have a minor beneficial impact on the current social and economic condition because it would continue to support a small business and the positive effects that has on the local community.

Alternative 1 provides for motorized boat access throughout most of the marine waters of the national seashore. The boating activities can damage and impact healthy seagrass beds that grow on the north side of the barrier islands. The seagrass beds are essential in supporting the fisheries of the northern Gulf of Mexico. As the seagrass beds deteriorate, the results could be a minor, long-term, adverse impact on the region's fisheries economy.

Overall, impacts on the social and economic environment from implementing alternative 1 would be minor, long-term, and adverse.

Cumulative Impacts

Opportunities for local and regional residents are enhanced by having continuous access to the recreational and educational opportunities at Gulf Islands National Seashore and other state and local parks. The national seashore provides open, natural spaces where various healthy outdoor activities can be enjoyed. Bordering many areas of the national seashore are dense developments. The national seashore provides a contrast between the urban and natural scenic settings.
The contribution of the national seashore to the local economy is very small when compared to the military and other retail, wholesale, and service sectors in communities surrounding the national seashore. Although a small part of the regional economy, there are many small businesses that rely on the national seashore as one of the major attractions for visitors to come to their communities. Over time, businesses have evolved and adjusted to the patterns and needs of these visitors.

Roads leading to the national seashore are also used by local and regional residents and commerce. Many of these roads have become congested as populations in the local communities continue to grow. Visitors traveling by vehicle to the national seashore contribute to the traffic congestion.

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on the social and economic environment may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of oil collected. These impacts may be minor to moderate in intensity.

The fisheries of the Northern Gulf of Mexico are important economic resources for communities along the entire coast. Gulf Islands National Seashore protects the dwindling nursery habitats that support the regional fishery economy by providing juvenile nurseries, feeding grounds, cover, and reproductive space.

Overall, the impacts of other past, present, and reasonably foreseeable actions just described would be long-term, minor, and adverse.

The impacts of alternative 1 actions related to the social and economic environment, combined with other past, present, and reasonably foreseeable actions by others, would have a minor, long-term, adverse cumulative impact on local residents and businesses as traffic

congestion increases, opportunities for easy and affordable access to the Mississippi barrier islands are reduced, and nursery fisheries habitat deteriorates. The contribution of alternative 1 to these cumulative impacts would be minimal.

Conclusion

The important open spaces of the national seashore would continue to contribute to the quality of life and have a minor, long-term, beneficial impact on local residents. At Okaloosa, unlawful acts and visitor safety are of concern in this high density area. NPS on-site presence is minimal and could continue to result in minor, long-term, adverse impacts on the local community. The limited water transportation to the Mississippi barrier islands could have a minor, long-term, adverse impact on local and regional residents. As the seagrass beds deteriorate, the results could be a minor to moderate, long-term, adverse impact on the region's fisheries economy. Overall, impacts on the social and economic environment from implementing alternative 1 would be minor, long-term, and adverse.

The cumulative impacts on the social and economic environment would be minor, long-term, and adverse. The contribution of alternative 1 to these cumulative impacts would be minimal.

IMPACTS OF IMPLEMENTING ALTERNATIVE 2

Analysis

In alternative 2, if national seashore roads in the Perdido Key, Fort Mason, and Santa Rosa Areas of the national seashore are substantially destroyed by coastal storms they would not be replaced. The tourist and local residents would still have access to pristine and undeveloped beaches within the national seashore, but not private vehicle and RV access to the campground at Fort Pickens. This action could have moderate, long-term, adverse impacts on local residents and regional visitors who would find their traditional ways of accessing beaches on Perdido Key eliminated and change the way they use the area. Some of the changes could have adverse effects on their national seashore experiences, and others might find the more primitive experience as a benefit. Visitor access to Johnson Beach would not be affected.

By not reconstructing the roads at Fort Pickens and Santa Rosa, there could be a moderate, long-term, adverse impact on the businesses and residents that rely on visitor traffic heading into the national seashore. In addition, bridge fees collected by the Santa Rosa Island Authority could decline. Road access east of Pensacola Beach could be eliminated and thereby focus all traffic to and from the island through one location. This would have a regional effect on traffic patterns, potentially increasing traffic on U.S. 98. If roads were replaced with alternative land or water transportation, then the impact might have a minor to moderate, long-term, adverse impact on the local community.

A minor to moderate, long-term, beneficial impact could result from reduced national seashore traffic traveling through Gulf Breeze and Pensacola Beach and help alleviate some congestion problems. On Santa Rosa, the road (if destroyed) would become a multiuse trail. The trail could be designed to be wide enough for one-way vehicular traffic to help move people off the island during special events and emergencies.

In alternative 2, nonessential NPS operations and staff that are on the barrier islands would be relocated to the more protected Davis Bayou and Naval Live Oak areas of the national seashore. This action could result in some minor intrusion to the open space that is currently available, but most likely would not be very noticeable. The increased activity relating to NPS operations at these two locations could result in some additional economic contribution to the local businesses. Overall these actions would most likely have very small impacts on the local communities and businesses.

The potential to increase the number of commercial use authorizations for water transportation to Cat Island in alternative 2 could increase revenue for small businesses and thereby have a minor, long-term, beneficial impact on those businesses.

Under this alternative, it is anticipated that revenue generated by the concessioner providing services to West Ship Island visitors would be reduced because these services would no longer be provided on the island but would only be provided from the boat. These conditions would likely result in a minor, long-term adverse impact on the operator.

Alternative 2 guides the national seashore in taking a more active role in restoring and preserving the seagrass beds along the barrier islands. The wild and natural conditions of the national seashore islands support the regional fishery economy by providing juvenile nurseries, feeding grounds, cover, and reproductive space. Enhancing the integrity of the seagrass beds could have a moderate, long-term, beneficial impact on the fisheries economy of the region.

Overall, impacts on the social and economic environment from implementing alternative 2 would be minor to moderate, long-term, and adverse, although increased water transportation and improved fisheries resources would have minor to moderate long-term beneficial impacts.

Cumulative Impacts

Opportunities for local and regional residents are enhanced by having continuous access to the recreational and educational opportunities at Gulf Islands National Seashore and other state and local parks. The national seashore provides open, natural spaces where various healthy outdoor activities can be enjoyed. Bordering many of the areas in the national seashore are dense developments. The national seashore provides a contrast between the urban and natural scenic settings.

The contribution of the national seashore to the local economy is very small when compared to the military and other retail, wholesale, and service sectors in communities surrounding the national seashore. Although a small part of the regional economy, there are many small businesses that rely on the national seashore as one of the major attractions for visitors to come to their communities. Over time, businesses have evolved and adjusted to the patterns and needs of these visitors.

Roads leading to the national seashore are also used by local and regional residents and commerce. Many of these roads have become congested as populations in the local communities continue to grow. Visitors traveling by vehicle to the national seashore contribute to the traffic congestion.

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on the social and economic environment may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of oil collected. These impacts may be minor to moderate in intensity.

The fisheries of the Northern Gulf of Mexico are important economic resources for communities along the entire coast. Gulf Islands National Seashore protects the dwindling nursery habitats that support the regional fishery economy by providing juvenile nurseries, feeding grounds, cover, and reproductive space.

Overall, the impacts of other past, present, and reasonably foreseeable actions just described would be minor, long-term, and adverse.

The impacts of alternative 2, combined with other past, present, and reasonably foreseeable actions by others, would have a minor to

moderate, long-term, adverse cumulative impact by potentially changing the routines of local residents and affecting the revenue of small businesses that depend on national seashore visitors. A decrease in vehicle traffic to areas of the national seashore, along with an increase in water transportation services, might have a minor, long-term, beneficial impact by decreasing traffic congestion in some gateway communities. The contribution of alternative 2 to these cumulative impacts would be modest.

Conclusion

Eliminating roads within the national seashore could have moderate, long-term adverse impacts on local residents and businesses. Traffic congestion might benefit from the reduction in the number of vehicles coming to the national seashore. Relocating NPS operations and staff to the Davis Bayou and Naval Live Oaks Areas could have a negligible impact on the local businesses and communities. And concession income for the passenger ferry to West Ship Island might decline if the operator is unable to provide on-island services away from the boat. Overall, impacts on the social and economic environment from implementing alternative 2 would be minor to moderate, long-term, and adverse although increased water transportation and improved fisheries resources would have minor to moderate, long-term, beneficial impacts.

The cumulative impacts on the social and economic environment would be minor, long-term, and adverse. The contribution of alternative 2 to these cumulative impacts would be modest.

IMPACTS OF IMPLEMENTING ALTERNATIVE 3

Analysis

Alternative 3 explores increasing the educational and interpretive opportunities at the Gulf Islands National Seashore. A proposed environmental education and research center would be established at Naval Live Oaks. Depending upon the type of programs, this new attraction could increase visitor's length of stay in this area and thereby contribute to the local tourism businesses. The center could also benefit local residents by providing access to more educational opportunities. At the Naval Air Station Historic Sites Area, an increase in national seashore programs and enhancement of historic resources could contribute to the diversity of historic attractions and complement the nearby historic district in Pensacola, Florida, and the Naval Air Station. At the Davis Bayou and Okaloosa Areas, new educational, stewardship, and interpretive programs could increase opportunities for local residents. An increased NPS presence at the Okaloosa Area could improve the level of security of this area and the adjacent neighborhoods. This area provides public access to waterfront swimming and other beach activities in a very congested community. Placing furnishings in the historic sites and structures and increasing the natural and cultural educational and interpretive programs could have a minor to moderate, long-term, beneficial impact on the social and economic conditions of adjacent communities.

Reducing the length of the road in the Perdido Key Area could result in a minor to moderate, long-term, adverse impact on the local and regional visitors who may find their traditional ways of accessing Perdido Key eliminated and change the way they use the area. Some of the changes could have adverse effects on their national seashore experience, and others might find the more primitive experience a benefit.

At Fort Pickens, the visitor facilities and access would continue to be provided. The

potential for ferry and private boat access to Fort Pickens could help alleviate some of the traffic congestion in Gulf Breeze and Pensacola Beach, Florida. The effects on the local economy would be expected to be minimal because Pensacola Beach is a tourist destination and also benefits from having vehicular access to Fort Pickens. These actions could have a minor to moderate, long-term, beneficial impact on local and regional residents and businesses if the water transportation is effective.

The passenger ferry to West and East Ship islands would continue to operate as it does today. This includes providing on-island visitor food and equipment rental services along the boardwalk corridor. Although this is a benefit to the visitor, it would continue to have a negligible impact on the current social and economic conditions.

Alternative 3 proposes actions to restore and preserve the seagrass beds along the barrier islands. The wild and natural conditions of the national seashore islands support the regional fishery economy by providing juvenile nurseries, feeding grounds, cover, and reproductive space. Enhancing the integrity of the seagrass beds would have a moderate, long-term, beneficial impact on the fisheries economy of the region.

Overall, impacts on the social and economic environment from implementing alternative 3 would be minor to moderate, long-term, and beneficial.

Cumulative Impacts

Opportunities for local and regional residents are enhanced by having continuous access to the recreational and educational opportunities at Gulf Islands National Seashore and other state and local parks. The national seashore provides open, natural spaces where various healthy outdoor activities can be enjoyed. Bordering many areas in the national seashore are dense developments. The national seashore provides a contrast between the urban and natural scenic settings.

The contribution of the national seashore to the local economy is modest when compared to the military and other retail, wholesale, and service sectors in communities surrounding the national seashore. Although a modest part of the local economy, there are many small businesses that rely on the national seashore as one of the major attractions for visitors to come to their communities. Over time, businesses have evolved and adjusted to the patterns and needs of these visitors.

Roads leading to the national seashore are also used by local and regional residents and commerce. Many of these roads have become congested as populations in the local communities continue to grow. Visitors traveling by vehicle to the national seashore contribute to the traffic congestion.

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on the social and economic environment may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of oil collected. These impacts may be minor to moderate in intensity.

The fisheries of the Northern Gulf of Mexico are important economic resources for communities along the entire coast. Gulf Islands National Seashore protects the dwindling nursery habitats that support the regional fishery economy by providing juvenile nurseries, feeding grounds, cover, and reproductive space.

Overall, the impacts of other past, present, and reasonably foreseeable actions just described would be long-term, minor, and adverse.

The impacts of alternative 3 actions on the social and economic environment, combined with other past, present, and reasonably

foreseeable actions by others, would have a minor, long-term, beneficial cumulative impact on local communities and businesses by providing new educational and interpretive opportunities, enhancing water transportation access, and strengthening seagrass beds that support the regional fisheries. The contribution of alternative 3 to these cumulative impacts would be modest.

Conclusion

In alternative 3, placing furnishings in the historic sites and structures and increasing the natural and cultural educational and interpretive programs could have a minor to moderate, long-term, beneficial impact on the social and economic conditions of adjacent communities. Reducing the length of the road in the Perdido Key Area of the national seashore could result in a minor to moderate, long-term, adverse impact on the local and regional visitor. There could be minor to moderate, long-term, beneficial impacts on local and regional residents and businesses if the water transportation is effective. Enhancing the integrity of the seagrass beds would have a moderate, long-term, beneficial impact on the fisheries economy of the region. Overall, impacts on the social and economic environment from implementing alternative 3 would be minor to moderate, long-term, and beneficial.

The cumulative impacts on the social and economic environment would be minor, long-term, and beneficial. The contribution of alternative 3 to these cumulative impacts would be modest.

IMPACTS OF IMPLEMENTING ALTERNATIVE 4

Analysis

Alternative 4 explores how the Gulf Islands National Seashore could increase the diversity of recreational, educational, and stewardship opportunities for visitors. The alternative considers increasing alternative land and water transportation systems while providing for existing vehicular access. A proposed environmental education and research center could be established at Fort Pickens. Depending upon the type of programs, this new attraction could increase visitor's length of stay at this area and thereby contribute to the local tourism businesses. The center could also benefit local residents by providing access to more educational opportunities. At the Naval Air Station Historic Sites Area, an increase in national seashore programs and enhancement of historic resources could contribute to the diversity of historic attractions and complement the nearby historic district in Pensacola, Florida, and the Naval Air Station. If water transportation proves feasible between Pensacola, the Fort Pickens Area, and the Naval Air Station Area, then the military and civilian workforce would have improved access to the national seashore. These actions could have a long-term, minor to moderate, beneficial impact on the local communities, businesses, and the tax base.

Alternative 4 also proposes to increase commercial services such as renting equipment and providing other visitor support services. In addition, commercial use authorizations could be provided to establish additional water transportation services between the Davis Bayou Area and the Mississippi islands. These actions could provide increased business opportunities for local and regional businesses. In addition, the commercial activities could provide more access to the barrier islands for local and regional residents and thereby have a moderate, long-term, beneficial impact.

The proposed land shuttle on Santa Rosa Island could provide additional visitor

opportunities within the national seashore and contribute to an increased length of stay with tourists visiting the resort areas of Pensacola Beach and Navarre Beach. A shuttle system could provide tourists with greater access to beaches of the national seashore. A successful coordinated regional effort in providing scheduled and dependable commercial access to Fort Pickens, along Santa Rosa Island, and Perdido Key from other ports in the region would help alleviate some of the traffic congestion in Gulf Breeze and Pensacola Beach and increase access to the national seashore for regional residents and visitors. This would have a moderate, long-term, beneficial impact on the regional social and economic conditions.

At Okaloosa, increased NPS presence, programs, new facilities, and visitor opportunities could increase local and regional use of this area. These same things could increase visitors' length of stay and result in some addition economic contribution to the local community and have a moderate, long-term, beneficial impact.

The passenger ferry to West and East Ship islands would continue to operate as it does today. This includes providing on-island food service and potential for providing recreational equipment rental services along the boardwalk corridor. Although this would be a benefit to the visitor, it would continue to have a negligible impact on the current social and economic conditions.

Alternative 4 proposes actions to restore and preserve the seagrass beds along the barrier islands. The wild and natural conditions of the national seashore islands support the regional fishery economy by providing juvenile nurseries, feeding grounds, cover, and reproductive space. Enhancing the integrity of the seagrass beds would have a moderate, long-term, beneficial impact on the fisheries economy of the region.

Overall, impacts on the social and economic environment from implementing alternative 4 would be moderate, long-term, and beneficial.

Cumulative Impacts

Opportunities for local and regional residents are enhanced by having continuous access to the recreational and educational opportunities at Gulf Islands National Seashore and other state and local parks. The national seashore provides open, natural spaces where various healthy outdoor activities can be enjoyed. Bordering many areas in the national seashore are dense developments. The national seashore provides a contrast between the urban and natural scenic settings.

The contribution of the national seashore to the local economy is very small when compared to the military and other retail, wholesale, and service sectors in communities surrounding the national seashore. Although a small part of the regional economy, there are many small businesses that rely on the national seashore as one of the major attractions for visitors to come to their communities. Over time, businesses have evolved and adjusted to the patterns and needs of these visitors.

Roads leading to the national seashore are also used by local and regional residents and commerce. Many of these roads have become congested as populations in the local communities continue to grow. Visitors traveling by vehicle to the national seashore contribute to the traffic congestion.

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on the social and economic environment may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of oil collected. These impacts may be minor to moderate in intensity.

The fisheries of the Northern Gulf of Mexico are important economic resources for communities along the entire coast. Gulf Islands

National Seashore protects the dwindling nursery habitats that support the regional fishery economy by providing juvenile nurseries, feeding grounds, cover, and reproductive space.

Overall, the impacts of other past, present, and reasonably foreseeable actions just described would be long-term, minor, and adverse.

The impacts on the social and economic environment proposed in alternative 4, combined with other past, present, and reasonably foreseeable actions by others, would have a minor to moderate, long-term, beneficial cumulative impact on local communities and businesses by providing a greater diversity of recreational, educational, and interpretive opportunities; providing alternative land shuttle and water transportation access over a greater region; and strengthening seagrass beds that support the regional fisheries economy. The contribution of alternative 4 to these cumulative impacts would be modest.

Conclusion

In alternative 4 the diversity of recreational and educational opportunities could have a minor to moderate, long-term beneficial impact on the local communities and businesses. Adding new commercial services that provide equipment rental and other visitor services including water transportation would contribute to the regional economy and local tax base. The proposed land shuttle on Santa Rosa Island could have a moderate, long-term, beneficial impact on the regional social and economic conditions. Increased NPS presence and programs at the Okaloosa Area could result in some additional economic contribution to the local community and have a moderate, long-term, beneficial impact. The restoration and preservation of the seagrass beds in the waters of the barrier islands could have a moderate, long-term, beneficial impact on the fisheries economy of the region. Overall, impacts on the social and economic environment from implementing alternative 4 would be moderate, long term, and beneficial.

The cumulative impacts on the social and economic environment would be minor to moderate, long-term, and beneficial. The contribution of alternative 4 to these cumulative impacts would be modest.

IMPACTS ON NPS OPERATIONS

METHODS AND ASSUMPTIONS FOR ANALYZING IMPACTS

The effects of implementing the alternatives on national seashore staffing and facilities were evaluated. The analysis was conducted in terms of how NPS operations and facilities might vary under the different management alternatives. The analysis is qualitative rather than quantitative because of the conceptual nature of the alternatives. Consequently professional judgment was used to reach reasonable conclusions as to the intensity, duration, and type of potential impact.

Duration of Impact

Short-term impacts on operations would generally be less than two years because most construction is generally completed within this timeframe and would last only until all construction-related action items are completed. Long-term impacts would extend beyond two years and have a permanent effect.

Definitions of Intensity Levels

Negligible: NPS operations would not be affected or the effect would be at or below the lower levels of detection.

Minor: The effects would be detectable, but would be of a magnitude that would not have an appreciable effect on NPS operations.

Moderate: he effects would be readily apparent and would result in a substantial change in NPS operations that would be noticeable to staff and the public.

Major: The effects would be readily apparent and would result in a substantial change in NPS operations that would be noticeable to staff and the public and be markedly different than existing operations.

Type of Impact

Beneficial impacts would improve NPS operations and/or facilities. Adverse impacts would negatively affect NPS operations and/or facilities and could hinder the staff's ability to provide adequate services and facilities to visitors and staff. Some impacts could be beneficial for some operations or facilities and adverse or neutral for others.

IMPACTS OF IMPLEMENTING ALTERNATIVE 1

Analysis

Throughout the national seashore, alternative 1 would replace visitor facilities, roads, and operations as hurricane-damaged structures and sites are reestablished. There would be an increase in the future costs of operations and facility investments resulting from replacement and/or repairs caused by future hurricanes—especially for facilities on the barrier islands. Continuing to replace and/or repair sites and structures after hurricanes and other storms would have a moderate, long-term, adverse impact.

The administrative headquarters/visitor center on the south side of Naval Live Oaks is inadequate to accommodate existing and future space needs for NPS management. Also, the operation and maintenance facilities at Naval Live Oaks are scattered in trailers and small structures that are inadequate to maintain efficient operations or to accommodate future needs. The current condition would continue to have a moderate, long-term, adverse impact on the efficiency of NPS operations.

Cat Island lacks any visitor facilities and utilities, which results in very little maintenance and operational needs. The lack of facilities to support management of Cat Island

would continue to have a long-term, negligible, impact on operations.

The current level of NPS staffing (about 86 full-time-equivalent or FTE employees) would be retained in alternative 1. This staffing level is not adequate to meet the national seashore's long-term operational and maintenance demands and to fully support protection of the natural and cultural resources. This situation would continue to have a minor, long-term, adverse impact.

In alternative 1 most staff would continue to be based in the field. This contributes to effective NPS operations, especially for interpretation, resource protection, and maintenance and thereby would have a continued moderate, long-term, beneficial impact. However, there would also be a moderate adverse impact when park facilities are damaged by storms.

Overall, impacts on NPS operations and facilities from implementing alternative 1 would continue to be minor to moderate, long term, and adverse.

Cumulative Impacts

The national seashore preserves and manages the natural setting and recreational opportunities surrounded by and/or in coordination with the Florida Department of Environmental Protection, Division of Recreation and Parks; the Mississippi Department of Wildlife, Fisheries and Parks; the Naval Air Station Pensacola Complex; and Eglin Air Force Base. Also, the communities of Perdido Key, Pensacola, Gulf Breeze, and Pensacola Beach in Florida and Ocean Springs and Gulfport in Mississippi continue to grow. The policies and decisions of these communities in relationship to transportation, economic, recreational, and growth management can influence and/or impact the management of the national seashore. The educational and research objectives of the University of West Florida and the Gulf Coast Research Laboratory of the University of Southern Mississippi rely partially on the wild nature of the national seashore. The National Naval Aviation Museum is a major attraction that helps contribute to a critical mass of activities within the area that the national seashore manages (i.e., the historic defense fortifications).

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on national seashore operations may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of oil collected. These impacts may be minor to moderate in intensity.

Interacting and coordinating with all these entities/organizations require NPS managers to participate in civic engagement, community problem-solving, and monitoring, and in providing input and technical assistance. All these efforts require NPS staff time and funds. As these organizations/entities grow, demand increases for access to and use of the national seashore's facilities and resources, resulting in the need for increased maintenance and periodic investment in national seashore assets.

Overall, the impacts of other past, present, and reasonably foreseeable actions just described would continue to be long term, minor, and adverse on NPS operations.

The impacts of proposed actions in alternative 1 on NPS operations, combined with the actions of other past, present, and reasonably foreseeable actions of others, would have a minor, long-term, adverse cumulative impact on the NPS operations and staff. The contribution of alternative 1 to these cumulative impacts would be very small.

Conclusion

Alternative 1 would likely continue to have a long-term, minor to moderate, adverse impact on national seashore operations. There would continue to be a long-term, minor, adverse cumulative impact on operations resulting from increased demands on national seashore resources and the need for NPS managers to focus on local and regional issues. The contribution of alternative 1 to these cumulative impacts would be negligible.

IMPACTS OF IMPLEMENTING ALTERNATIVE 2

Analysis

In alternative 2, some of the administrative, managerial, and operational facilities and functions that exist on the barrier islands would be relocated to the mainland if significantly damaged by future hurricanes. Also, if damaged after future storms, only essential visitor services would be retained at Fort Pickens, West Ship Island, and Perdido Key, and many of the facilities on the barrier islands and some roads on Santa Rosa Island and at Perdido Key would not be replaced. This would result in a decrease in operational costs and maintenance and a savings in future facility investments. To accommodate the redistribution of staff and operations, a new maintenance facility would be required at Naval Live Oaks, and the maintenance facility at Davis Bayou would need to be expanded. Construction would meet the space requirements and result in increased operational efficiencies. These actions would have a moderate to major, long-term, beneficial impact on NPS operations by consolidating and centralizing operations; this would also have a moderate adverse impact because staff would not be distributed throughout the park to deal with operational problems more directly but would have to travel to the islands to do so.

The management and administrative offices at Naval Live Oaks would be relocated to a leased private office space in the adjacent community. This would result in an increase of administrative overhead and fewer opportunities to interact with other NPS staff—a moderate, long-term, adverse impact on NPS operations.

An NPS docking facility would be developed on Cat Island to support NPS management and operations and provide commercial water transportation services with temporary docking. Some trail and dispersed camping would be provided. These actions at Cat Island would have a minor, long-term, beneficial effect on NPS operations.

An additional 13 NPS full-time-equivalent employees would be required for alternative 2 to support increased management activities associated with

- protection of the seagrass management areas
- implementation of a camping permit system on the barrier islands and stronger wilderness management
- added reliance on water transportation for NPS staff
- new interpretive programs at Fort Pickens
- establishment of a marine management program
- an expanded cultural and natural monitoring program
- providing enough administrative staff to manage the expanded commercial services program and potential land and/or water shuttle
- maintenance needs for the new facilities acquired/developed, including new water shuttle docks at Fort Pickens, new facilities at Cat Island, new land and/or water shuttle systems if developed, and possibly the Pensacola Lighthouse complex

The increased staffing would have a moderate, long-term, adverse impact on the NPS operating budget. However, increased staffing for the actions listed above would have a moderate, long-term, beneficial impact on the

operations and management needed to effectively support the protection of natural and cultural resources and visitor enjoyment.

Overall, impacts on NPS operations and facilities from implementing alternative 2 would be minor to moderate, long term, and beneficial. When a major storm significantly damages the NPS roads and facilities on the barrier islands, many of these facilities would not be replaced and result in operational and facility investment savings.

Cumulative Impacts

The national seashore preserves and manages the natural setting and recreational opportunities surrounded by and/or in coordination with the Florida Department of Environmental Protection, Division of Recreation and Parks; the Mississippi Department of Wildlife, Fisheries and Parks; the Naval Air Station Pensacola Complex; and Eglin Air Force Base. Also, the communities of Perdido Key, Pensacola, Gulf Breeze, and Pensacola Beach in Florida and Ocean Springs and Gulfport in Mississippi continue to grow. The policies and decisions of these communities in relationship to transportation, economic, recreational, and growth management can influence and/or impact the management of the national seashore. The educational and research objectives of the University of West Florida and the Gulf Coast Research Laboratory of the University of Southern Mississippi rely partially on the wild nature of the national seashore. The National Naval Aviation Museum is a major attraction that helps contribute to a critical mass of activities within the area that the national seashore manages (i.e., the historic defense fortifications).

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on national seashore operations may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of oil collected. These impacts may be minor to moderate in intensity.

Interacting and coordinating with all these entities/organizations require NPS managers to participate in civic engagement, community problem-solving, and monitoring, and in providing input and technical assistance. All these efforts require NPS staff time and funds. As these organizations/entities grow, demand increases for access to and use of the national seashore's facilities and resources, resulting in the need for increased maintenance and periodic investment in national seashore assets.

Overall, the impacts of other past, present, and reasonably foreseeable actions just described on NPS operations would be long term, minor, and adverse.

The impacts of alternative 2 actions on NPS operations, combined with the actions of other past, present, and reasonably foreseeable actions of others, would have a minor, long-term, beneficial cumulative impact on the NPS operations and staff. The contribution of alternative 2 to these cumulative impacts would be noticeable.

Conclusion

Actions proposed in alternative 2 would be expected to have a long-term, minor to moderate, beneficial impact on national seashore operations. There would be a long-term, minor, adverse cumulative impact on operations resulting from increase demands on national seashore resources and the need for NPS managers to focus on local and regional issues. The contribution of alternative 2 to these cumulative impacts would be noticeable.

IMPACTS OF IMPLEMENTING ALTERNATIVE 3

Analysis

Alternative 3 emphasizes significantly enhanced interpretive and educational programs throughout the national seashore. Existing visitor centers and contact stations would have improved staffing and visitor programs. Historic structures throughout the national seashore would be better used for interpretive and educational programs. The appearance, function, and programs at the seacoast defense fortifications would be strengthened. If acquired, the Pensacola Lighthouse would have visitor services and programs. A mobile interpretive/environmental education vehicle would be used to expand programs at more sites throughout the national seashore. At Naval Live Oaks the current administrative facility would become an environmental education and research center. These expanded educational and interpretive programs and the increased restoration of historic structures would require increases in NPS operation and maintenance programs and budgets, which would result in a moderate, long-term, adverse impact on NPS operations and national seashore assets.

On the north side of Naval Live Oaks the new maintenance and administrative facilities would be constructed to accommodate current and future space needs. This would have a moderate, long-term, beneficial impact on the efficiency of operations.

An NPS docking facility would be developed on Cat Island to support NPS management and operations and provide commercial water transportation services. Some trail and dispersed camping would be provided. These actions at Cat Island would have a minor, long-term, beneficial effect on NPS operations.

New facilities on Cat Island would be developed to support the environmental education/research programs that include group campgrounds and related support structures. These facilities would add to the facility asset maintenance program. They would also be at risk of damage from future hurricanes. The maintenance and potential future replacement of these facilities would have a minor, long-term, adverse impact on NPS operations.

An additional 20 NPS full-time-equivalent employees would be required for alternative 3 to support increases management activities associated with

- protection of the seagrass management areas
- implementation of a camping permit system on the barrier islands and stronger wilderness management
- new and expanded interpretive and educational programs throughout the national seashore
- establishment of an environmental education and research center
- an expanded cultural and natural monitoring program
- establishment of a marine management program
- additional administrative staff to manage the expanded commercial services program and potential land and/or water shuttle
- maintenance needs for the new facilities acquired/developed, including new water shuttle docks at Fort Pickens, new facilities at Cat Island, new land and/or water shuttle systems if developed, and possibly the Pensacola Lighthouse complex

The increased staffing would have a moderate, long-term, adverse impact on the NPS operating budget. However, increased staffing for the actions listed above would have a moderate, long-term, beneficial impact on the operations and management needed to effectively support the protection of natural and cultural resources and visitor enjoyment.

Overall, impacts on NPS operations and facilities from implementing alternative 3 would be minor, long-term, and beneficial.

Cumulative Impacts

The national seashore preserves and manages the natural setting and recreational opportunities surrounded by and/or in coordination with the Florida Department of Environmental Protection, Division of Recreation and Parks; the Mississippi Department of Wildlife, Fisheries and Parks; the Naval Air Station Pensacola Complex; and Eglin Air Force Base. In addition, the communities of Perdido Key, Pensacola, Gulf Breeze, and Pensacola Beach in Florida and Ocean Springs and Gulfport in Mississippi continue to grow. The policies and decisions of these communities in relationship to transportation, economic, recreation, and growth management can influence and/or impact the management of the national seashore. The educational and research objectives of the University of West Florida and the Gulf Coast Research Laboratory of the University of Southern Mississippi rely partially on the wild nature of the national seashore. The National Naval Aviation Museum is a major attraction that helps contribute to a critical mass of activities within the area that the national seashore manages (i.e., the historic defense fortifications).

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on national seashore operations may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of oil collected. These impacts may be minor to moderate in intensity.

Interacting and coordinating with all these entities/organizations require NPS managers to participate in civic engagement, community problem-solving, and monitoring, and in providing input and technical assistance. All these efforts require NPS staff time and funds. As these organizations/entities grow, demand increases for access to and use of the national seashore's facilities and resources, resulting in the need for increased maintenance and periodic investment in national seashore assets.

Overall, the impacts of other past, present, and reasonably foreseeable actions just described would be long term, minor, and adverse on NPS operations.

The impacts of alternative 3 actions on NPS operations, combined with the actions of other past, present, and reasonably foreseeable actions of others, would have a minor, long-term, adverse cumulative impact on the NPS operations and staff. The contribution of alternative 3 to these cumulative impacts would be noticeable.

Conclusion

Actions proposed in alternative 3 would be expected to have a long-term, minor beneficial impact on national seashore operations. There would be a long-term, minor, adverse cumulative impact on operations resulting from increased demands on national seashore resources and the need for NPS managers to focus on local and regional issues. The contribution of alternative 3 to these cumulative impacts would be noticeable.

IMPACTS OF IMPLEMENTING ALTERNATIVE 4

Analysis

Alternative 4 proposed actions include many new facilities and expanded visitor programs that support added recreational, interpretive, and educational opportunities throughout the national seashore. All current national seashore assets would be retained and fully used to support visitor services and

opportunities. New facilities would be constructed and maintained to support visitor experiences such as hiking on multiuse trails, camping, a visitor contact station at Okaloosa, boat landings and small piers for temporary tie ups, new beach access areas with parking areas, restrooms, boardwalks, beaches with lifeguards, and a partnership-operated environmental education and research center. Commercial service opportunities would be available at appropriate locations to provide visitors with rental equipment, tours, and food services.

This alternative envisions a regional partnership providing visitors with water transportation systems that link Fort Pickens with the city of Pensacola and the Naval Air Station Historic Sites Area. Additional water transportation would be established at Davis Bayou with access to the barrier islands in the Mississippi District. This action would require periodic dredging at Davis Bayou to accommodate the larger vessels needed to transport visitors. In addition, opportunities would be explored for a partnership to operate a land shuttle system on Santa Rosa Island. All existing roads and facilities would be maintained and reconstructed if damaged by hurricanes.

The increased level of investment and maintenance in facilities, management of commercial services, development of transportation partnerships, and added requirements for resource and visitor protection would have a moderate to major, long-term, adverse impact on NPS operational budgets.

Alternative 4 would construct a new maintenance facility for the Florida District at Naval Live Oaks. Only essential services would be retained at other national seashore sites. This action would have a minor to moderate, long-term beneficial impact on the Maintenance and Facility Division.

An NPS docking facility would be developed on Cat Island to support NPS management and operations and provide commercial water transportation services and private boaters with temporary docking. Some trails and primitive campsites would be provided. These minimal facilities at Cat Island would provide access and tie-up for NPS vessels and would have a minor, long-term, beneficial effect on NPS operations.

An additional 22 NPS full-time-equivalent employees would be required for alternative 4 to support increases management activities associated with

- protection of the seagrass management areas
- implementation of a camping permit system on the barrier islands and stronger wilderness management
- new and expanded recreational facilities and beach access areas
- new and expanded interpretive and educational programs throughout the national seashore
- an expanded cultural and natural monitoring and protection program
- the additional administrative staff needed to manage the expanded commercial services program and potential land and/or water transportation/water shuttle, and dredging requirements
- maintenance needs for the new facilities acquired/developed, including new water shuttle docks at Fort Pickens, new facilities at Cat Island, new land and/or water shuttle systems if developed, and possibly the Pensacola Lighthouse complex

The increased staffing would have a moderate to major, long-term, adverse impact on the NPS operating budget. However, increased staffing for the actions listed above would have a moderate, long-term, beneficial impact on the operations and management needed to effectively support the protection of natural and cultural resources and visitor enjoyment. The added new facilities, roads, trails, and alternative transportation infrastructure would require a much larger NPS operations and maintenance staff and would significantly

increase the number of assets exposed to potential hurricane damage and increases in future facility replacement costs, which would result in a major, long-term, adverse impact on NPS operations.

Overall, impacts on NPS operations and facilities from implementing alternative 4 would be moderate, long term, and adverse.

Cumulative Impacts

The national seashore preserves and manages the natural setting and recreational opportunities surrounded by and/or in coordination with the Florida Department of Environmental Protection, Division of Recreation and Parks; the Mississippi Department of Wildlife, Fisheries and Parks; the Naval Air Station Pensacola Complex; and Eglin Air Force Base. Also, the communities of Perdido Key, Pensacola, Gulf Breeze, and Pensacola Beach in Florida and Ocean Springs and Gulfport in Mississippi continue to grow. The policies and decisions of these communities in relationship to transportation, economic, recreational, and growth management can influence and/or impact the management of the national seashore. The educational and research objectives of the University of West Florida and the Gulf Coast Research Laboratory of the University of Southern Mississippi rely partially on the wild nature of the national seashore. The National Naval Aviation Museum is a major attraction that helps contribute to a critical mass of activities within the area that the national seashore manages (i.e., the historic defense fortifications).

Deepwater Horizon oil spill response activities, including shoreline treatment, deeper cleaning of sand and beaches, and no further treatment areas, will continue for an undetermined period into the future. Exact impacts of the response are unknown at this time. Impacts of the oil spill response activities on national seashore operations may be long-term and both adverse and beneficial, depending on the location, level of disturbance, and amount of oil collected. These impacts may be minor to moderate in intensity.

Interacting and coordinating with all these entities/organizations require NPS managers to participate in civic engagement, community problem-solving, and monitoring, and in providing input and technical assistance. All these efforts require NPS staff time and funds. As these organizations/entities grow, demand increases for access to and use of the national seashore's facilities and resources, resulting in the need for increased maintenance and periodic investment in national seashore assets.

Overall, the impacts of other past, present, and reasonably foreseeable actions just described would be long term, minor, and adverse on NPS operations.

The impacts of alternative 4 actions on NPS operations, combined with the actions of other past, present, and reasonably foreseeable actions of others, would have a minor, long-term, adverse cumulative impact on NPS operations and staff. The contribution of alternative 4 to these cumulative impacts would be noticeable.

Conclusion

Actions proposed in alternative 4 would be expected to have a long-term, moderate, adverse impact on national seashore operations. There would be a long-term, minor, adverse cumulative impact on NPS operations resulting from increase demands on national seashore resources and the need for NPS managers to focus on local and regional issues. The contribution of alternative 4 to these cumulative impacts would be noticeable.

OTHER REQUIRED ANALYSES

UNAVOIDABLE ADVERSE IMPACTS

Under all of the alternatives, some negligible to moderate impacts on soils, vegetation, wildlife, and water resources caused by recreational use and facilities would be essentially unavoidable (e.g., soil compaction, vegetation trampling, and wildlife disturbances). Increases in visitor use would have low level adverse impacts on local transportation systems.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Irreversible commitments of resources are actions that result in loss of resources that cannot be reversed. Irretrievable commitments of resources are actions that result in the loss of resources but only for a limited period of time.

With the exception of consumption of fuels and raw materials for maintenance or construction activities, there would be no irreversible or irretrievable commitments of resources under any of the alternatives.

RELATIONSHIP OF SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

Under all alternatives, the National Seashore would continue to be used by the public, and most areas would be protected in a natural state. The National Park Service would continue to manage the national seashore to maintain ecological processes and native biological communities and to provide appropriate recreational opportunities consistent with the preservation of cultural and natural resources. Actions would be taken with care to minimize adverse effects on the long-term productivity of biotic communities.

Under the no-action alternative there would be virtually no new development and no appreciable loss of long-term ecological productivity.

Under the alternative 2, there would be a modest number of new recreational facilities, which could reduce ecological productivity in some localized areas. However, this alternative would yield long-term benefits from a visitor experience perspective.

Under alternative 3 and 4 there would be expanded (but still relatively modest) facilities to support recreational use and some localized loss of ecological productivity. However, both alternatives would yield long-term benefits from a visitor experience perspective.

ENERGY REQUIREMENTS AND CONSERVATION POTENTIAL

Alternative 1 (No-Action)

Energy requirements would be unchanged under alternative 1 because no new structures would be built and the way in which visitors reach the national seashore would not change. Gradually improving the energy efficiency of existing structures could reduce existing energy requirements. Alternative 1 would result in the

Alternative 2

Energy requirements would be reduced under alternative 2, with the eventual removal of roads on barrier islands and the implementation of a ferry system to reach the Fort Pickens Area.

Alternative 3 (NPS Preferred Alternative)

More energy would be consumed under alternative 3 than under alternative 2 with the

continued use of the Fort Pickens access road by park visitors. Additional facility development would also require an increase in energy consumption.

Alternative 4

Under this alternative, the greatest consumption of energy would be required as this alternative continues use of the Fort Pickens access road by park visitors and entails a greater level of facility development.

Under all alternatives, the National Park Service would pursue sustainable practices wherever possible in all decisions retarding national seashore operations, facilities management, and developments. Whenever possible, the National Park Service would use energy conservation technologies and renewable energy sources. All three action alternatives support nonmotorized access for visitors to enjoy the national seashore. These actions would provide positive benefits in the area of energy and conservation potential.

CONSULTATION AND COORDINATION

GULF ISLANDS NATIONAL SEASHORE

CHAPTER FIVE

PUBLIC AND AGENCY INVOLVEMENT

PUBLIC INVOLVEMENT

The National Park Service actively engaged the public, stakeholders, and government officials at the federal, state, and local levels throughout the planning process. The following briefly summarizes public involvement activities. The time line is then followed by a summary of public comments received.

Public Scoping

The National Park Service initiated public scoping for the general management plan in 2004 with a scoping newsletter, followed by a series of public open houses. The newsletter outlined the need for the general management plan, discussed the significance of the national seashore, provided a timeline for the planning process, and outlined planning issues known to date. The newsletter also contained a public comment form and the dates for upcoming open houses. The newsletter was mailed to individuals, organizations, and government entities on the park's public contact mailing list in May 2004.

On May 25, 2004, the team issued a news release to local Mississippi and Florida newspapers announcing that open houses would be held on June 8, 2004, in Gulf Breeze, Florida, and on June 10, 2004, in Ocean Springs, Mississippi. Twenty-three individuals attended the Florida meeting, including representatives from local businesses, environmental groups, and the military. Thirteen individuals participated in the Mississippi meeting, including representative from similar groups. Planning team members captured verbal public comments on flipcharts. Team members also encouraged the public to express their views by filling out public comment forms and turning them in at the public meeting or mailing them in later.

Hurricanes and Deferred Planning

Between 2004 and 2007, the national seashore sustained heavy damage from a series of hurricanes, especially hurricanes Ivan (2004) and Dennis, Katrina, and Rita (all 2005). The storms damaged or destroyed significant portions of the park's infrastructure multiple times. Recovery and remediation efforts at the park demanded that the general management planning process be put on hold between 2004 and 2007.

Alternatives Development and Public Meetings

In March 2007 the National Park Service restarted the planning process by issuing a second newsletter. The newsletter reiterated the need for the plan and the national seashore's purpose and significance. The newsletter also summarized planning issues collected through public scoping and presented preliminary conceptual management alternatives. The newsletter was sent to individuals, organizations, and government entities on the national seashore's mailing list and posted to the NPS public Planning, Environment, and Public Comment (PEPC) website. The national seashore received 47 comments forms, several pieces of written correspondence, and 19 postings on the PEPC website.

In April 2007 the national seashore hosted additional public open houses to further explain and receive feedback on the preliminary conceptual alternatives. The national seashore issued a new release announcing the open houses on April 10, 2007. On April 17, the national seashore hosted an open house in Gulf Breeze, Florida, which was attended by 12 parties. A second open house was held in Ocean Springs, Mississippi, on April 19, 2007. Six individuals attended the second meeting.

Planning Update / Draft General Management Plan

Using public feedback on the conceptual alternatives, the national seashore staff and planning team finalized the alternatives and began drafting a the *Draft General Management Plan / Environmental Impact Statement* between 2007 and 2011.

In 2010 a third newsletter updating the progress made in preparing the plan was released. The team used feedback from the newsletter and public meetings to finalize the draft plan, which was published and released to the public in ____, 2011.

Summary of Public Comments from the 2004 Public Meetings and 2007 Newsletter and Public Meetings

Preservation of Coastal Ecosystems

- **Coastal Drilling**—One commenter had concerns of impacts from the oil rigs. Other people commented that oil rigs are visible on the horizon.
- **Seagrass Preservation**—Numerous people expressed concerns about damage to seagrass beds at Perdido Key, Naval Live Oaks, and Santa Rosa Island. A few expressed concerns about potential negative impacts on seagrass beds from barge traffic near Naval Live Oaks.
- **Vegetation Thinning/Invasive Species/Prescribed Burns**—Many commenters were outspoken on what they thought were overly aggressive thinning of vegetation at Naval Live Oaks. Others noted the need to control invasive vegetation along national seashore boundaries or incorporate prescribed burning in the same area.
- **Sensitive Habitats**—Several comments noted the need to protect sensitive species such as sea turtles, terns, skimmers, and the dunes at Santa Rosa Island. One responder wanted a mandate for lights-off in turtle nesting areas. One commenter did not understand the need to prohibit using the beaches during osprey nesting periods. One commenter recommended additional monitoring and enforcement to control unlawful commercial fishing in the national seashore. Some voiced concerns about water quality issues in Santa Rosa Sound.

Urban Encroachment

- **Restrict Development**—Some individuals wanted to keep University of Western Florida property on Santa Rosa Island undeveloped. Others wanted Naval Live Oaks to be maintained as natural as possible, expressed concerns about noise impacts from personal watercraft, and wanted maintenance facilities and offices moved to a location outside the national seashore. Some raised concerns about the development adjacent to national seashore boundaries on Perdido Key. Others urged that no facilitates be developed on Petit Bois Island. Several noted the beauty and solitude of Horn Island and discouraged any development or new facilities.
- **Community Partnerships**—Some commenters encouraged partnering with local communities in zoning and influencing local development that supports the national seashore's goals at Naval Live Oaks. Others suggested partnering with the Pensacola Naval Air Station.

Enhancing Public Access

- **Barriers to Access**—One commenter pointed out that the gate at Naval Live Oaks limits access for kayaking and windsurfing.
- **New Forms of Access**—Some commenters pointed out the need for alternative transportation instead of the bridge at Naval Live Oaks [commenter

likely meant bridge at Pensacola Beach]. Some of the newsletter respondents suggested improving access by providing more opportunities for biking, land shuttles, water taxis, monorail, and gravel roads. One commercial service provider suggested allowing a minimum of three drop-off points for each Mississippi island to allow flexibility in safely retrieving visitors during variable weather conditions. Some suggested providing electric carts for disabled visitors in areas where cars may be restricted.

- **Boat Access**—Some responders thought a range of different sized boats should provide service to Fort Pickens and Santa Rosa Island. Charter boat operators expressed interest in working with the National Park Service to provide more flexible access to the national seashore. One commenter requested that provisions be made in proposed nonmotorized zones to allow access to the islands by fisherman and campers.
- **Parking**—A few individuals noted that parking was a problem at Fort Pickens. One person cited the need to find alternate ways to circulate people in and out of the fort. Others noted that there was not enough parking on Santa Rosa Island.
- **Land Acquisition**—Some people believed a parcel of land should be acquired from Eglin Air Force Base. Others suggested expanding the national seashore boundaries to incorporate the western portion of Dauphin Island to include Alabama coastal forts.
- **Facilities**—Some individuals cited the need for restrooms on Perdido Key. Some newsletter commenters suggested adding more boardwalks to accommodate wheelchairs. One commenter wanted the Naval Live Oaks trail to be more accessible to the disabled. Others wanted facilities to allow them to lock up their boats while they explored areas of the national seashore. Some suggested using a more sustainable surface option versus asphalt for rebuilding the road to Fort Pickens. Others wanted a quick, "sacrificial" road built. Some wanted access to more facilities at Fort Pickens and access to some of the other forts. Others wanted piers for the safe drop-off/pick-up of passengers. One commenter suggested using a registration system if picnic pavilions are reduced from the current 100 [commenter likely meant current number]. Some suggested greater emphasis on sustainable green technologies in NPS facilities and the use of mobile structures that could be removed before storms. One commenter suggested adaptively reusing the Coast Guard Station for an interpretive museum.

Enhancing Education and Interpretation

- **Solitude and Scenic Views**—Numerous individuals commented on the importance of scenic views, sunsets, and solitude found in various locations throughout the national seashore. Views and solitude at Opal Beach on Santa Rosa Island and on Naval Live Oaks were highly valued. Several individuals noted that Petit Bois had excellent, uncrowded beaches, although occasionally large groups (70+ boats) from Pascagoula gather on nearby Spoil Island. Some commenters wanted personal watercrafts to be banned, while others promoted using them for access to the islands.
- **Interpretation**—Several individuals thought there was a need to interpret the importance of seagrass beds, and that one of the batteries at Fort Pickens should be interpreted. Some cited the need for interpretive materials and species inventories on Naval Live Oaks and at Cat Island. One responder did not want to see interpretive signs in Spanish. Some responders wanted to see diversity in interpretive programs such as bird tours, junior ranger activities, a new

introductory film, and seasonal interpretive messages.

- **Educational Programs**—Some felt there was a need for environmental program/labs at Fort Pickens, on Santa Rosa Island, and on Cat Island. Some thought interpretive programs and messages should be incorporated into land and water shuttle services. One commenter felt there should greater emphasis on enhancing education/ interpretation staff and not on infrastructure.
- **Interaction of Park Staff**—One commenter thought there should be greater communication between NPS staff and visitors. Another thought there should be greater emphasis in using volunteers to help the national seashore fulfill its mission.

Increased Recreational Opportunities

- **Overall**—Many respondents cited the area's natural beauty and/or undeveloped character and lack of commercial facilities as what made Gulf Island National Seashore special to them. Several commenters cited other specific features that were special to them. These included the area's range of readily accessible outdoor recreation and education opportunities within one of the last remnants of an undeveloped coastline, the opportunities to learn about history and habitat, and the diversity of ecosystems available to explore.
- **Beaches**—Swimming enthusiasts expressed concerns about overcrowding at Langdon Beach. Several commented on how they liked to boat to and camp at Fort McRee and Big Lagoon Beach on Perdido Key. Some commenters noted overcrowded conditions on Davis Bayou and Horn Island (May through Labor Day on Horn Island). Some suggested restricting access to Horn Island during the peak season. One commenter wanted more recreational beach areas designated, while another wanted to see more bathhouses. One commenter wanted dogs to be allowed on the beach during certain times of the year. Another wanted the beaches opened to equestrian use.
- **Fishing**—Several individuals noted that Ship Island and Cat Island had several excellent fishing locations
- **Scuba Diving/Snorkel/Swimming**—Several individuals commented that the sheltered waters around Fort Pickens were ideal for scuba diving, snorkeling, and swimming. Others enjoyed exploring shipwrecks near Fort Pickens and Santa Rosa Sound. Some felt the reef should be enhanced and/or expanded. Some felt Santa Rosa Island should be developed for scuba diving.
- **Boating/Kayaking**—Naval Live Oaks was cited as good location for kayaking, and Oriole Beach was a good place to launch sail boats. Some valued the kayak trail on Perdido Key.
- **Camping**—Some individuals did not like having to get a camping permit at Fort Pickens; others felt the campground should be expanded at this location. Many like boat-camping throughout the national seashore. Several commenters expressed concerns about boat rendezvous and other larger gatherings on Ship Island. Some newsletter commenters suggested separating tent and recreational vehicle camping, enforcing quiet hours, and providing more primitive camping opportunities in the Naval Live Oaks Area. One commenter thought the campground registration should be moved to the store at Fort Pickens. Another suggested placing Federal Emergency Management Administration trailers at Fort Pickens as primitive overnight accommodations. One responder wanted fee collection to shift to an honor system and have campground hosts monitor sites and fee compliance.

- **Biking/Hiking/Picnicking**—Several commenters indicated they liked biking and picnicking at Fort Pickens and biking through Naval Live Oaks
- **Trails**—Some responders felt Santa Rosa Island should be part of Florida 40-Mile Loop Trail. Others wanted a loop trail developed for Fort Pickens and on Naval Live Oaks on the north side of the beach. Others valued the trail from the center of Naval Live Oaks to Gulf Breeze, the Butcher Cove trail, and the Andrew Jackson Trail.
- **Birding**—Several people noted that Petit Bois Island had conditions that attracted numerous species of birds.

Management of Cat Island

- **Education**—Some felt Cat Island would be a good location for eco-tourism and educating the public on resources awareness. Some suggested providing educational outreach for commercial service providers to enhance appreciation for national seashore resources. Other suggested there be educational outreach when portions of the national seashore are closed. One commenter suggested that Mississippi education programs be conducted on the mainland because of the remoteness of the islands.
- **Access**—Some felt access to the island should be managed. Currently there is no public transportation to the island.
- **Resources**—Several mentioned that fishing was good in the shallow waters around Cat Island. The island contains World War II cultural remains.

Planning Effort (Newsletter Respondents)

- **Range of Alternatives**—About half of the respondents felt a reasonable range of alternatives was presented in the newsletter. Some suggested combining the educational components in alternative 3 with the other alternatives. One commenter suggested incorporating the best virtues from each alternative into a new alternative. A few questioned the appropriateness of applying a single set of alternatives along the entire seashore as the Florida District has significantly more historic resources and a higher density of use than the Mississippi District , which has few human-related resources.
- **Alternatives Comparison**—Many commenters favored the no-action alternative 1, while several preferred alternative 2. One specifically favored alternative 3, others did not think there was much difference between alternative 3 and the other alternatives. Several respondents thought existing facilities already provided an education experience. Some expressed concerns that alternative 3 might limit access to portions of the national seashore during outdoor education programs. Some stated they didn't like alternative 4 because it promoted too much commercialization, while others suggested combining portions of alternative 4 with alternative 3. One commenter liked alternative 4's focus on partnerships with regional centers of knowledge.
- **Critical Elements of the Preferred Alternatives**—Many respondents wanted the preferred alternative to have provisions for keeping the national seashore natural by protecting resources, limiting development, and limiting commercial activities. Some felt that restoring programs, facilities, and access affected by the hurricanes should be included, as well as cleaning up the asphalt on the beach. One respondent thought the preferred should include more facilities to accommodate increased visitation, another thought it should address volunteers, while a third thought it should address replenishing barrier islands as they erode. A few commenters felt that the planning process took too long.

FEDERAL AGENCIES

The National Park Service contacted the U.S. Fish and Wildlife Service (USFWS) offices in Mississippi and Florida, and the National Marine Fisheries Service (NMFS) on April 9, 2009. The letter advised these agencies of the NPS planning process for this *General Management Plan / Environmental Impact Statement* and requested a current list of federally listed threatened, endangered, or candidate species within the national seashore. The USFWS Panama City, Florida, office replied in a letter dated May 5, 2009, with updated species information and an Internet link to current species listings. The USFWS Jackson, Mississippi, office did not respond. The NMFS office in St. Petersburg, Florida, responded via email on April 17, 2009, with a current list of marine species and critical habitat managed by that agency.

In subsequent discussions, the project team deliberated about how to fulfill NPS responsibilities for complying with Section 7 of the Endangered Species Act. The outcome of these discussions, based on current procedures and relationships with the federal partner agencies, was to include an embedded "Biological Assessment" in this plan, with associated appendixes as needed for consultation. The anticipated response is the preparation of a "Biological Opinion" for those species with anticipated "may affect, likely to adversely affect" effects, and concurrence with NPS determination of "may affect, not likely to adversely affect" for other species. The responses are anticipated to provide mitigation measures for the National Park Service to follow to ensure protection of certain threatened or endangered species.

The Advisory Council on Historic Preservation will have an opportunity to review and comment on this draft plan.

STATE AGENCIES

The National Park Service contacted the Florida and Mississippi state historic preservation officers in letters dated November 7, 2003. The letters advised both offices about the start of the planning effort, asked for their involvement in the planning process, and solicited input on issues and concerns to be addressed by the plan. No responses were received. Both these agencies will have an opportunity to review and comment on this draft plan.

The National Park Service contacted the Florida Fish and Wildlife Conservation Commission and the Mississippi Natural Heritage Program in letters dated April 9, 2009. The Florida agency responded with information about the currency of their Internet-based species list. The Mississippi agency responded with information about modifications and potential additions to their state list. Both these agencies will have an opportunity to review and comment on this draft plan.

The National Park Service will request consistency determinations for the federal Coastal Zone Management Act. In Florida, this review will be coordinated by the Florida Coastal Management Program of the Florida Department of Environmental Protection. In Mississippi this review will be coordinated through the Mississippi Coastal Program through the Mississippi Department of Marine Resources. The National Park Service proposes no development in any area of the national seashore that would conflict with the coastal management program.

AMERICAN INDIAN TRIBES

The National Park Service recognizes that indigenous peoples may have traditional interests and rights in lands now under NPS management. Related Native American concerns are sought through Native American consultations. The need for government-to-government Native American

consultations stems from the historic power of Congress to make treaties with American Indian tribes as sovereign nations. Consultations with American Indians and other Native Americans, such as Native Hawaiians and Alaska Natives, are required by various federal laws, executive orders, regulations, and policies. They are needed, for example, to comply with Section 106 of the National Historic Preservation Act of 1966 as amended. Implementing regulations of the Council on Environmental Quality for the National Environmental Policy Act of 1969 (NEPA) also call for Native American consultations.

The National Park Service contacted 26 federally recognized tribes in letters dated April 27, 2004. The NPS letter advised the tribes of the planning process, invited them to participate in planning, and inquired about the tribes' potential interests and concerns as they relate to the planning effort. The tribes that were contacted are listed below. The Chitimacha Indian Tribe (Chitimacha Tribe of Louisiana) responded in a letter dated May 24, 2004. The tribe declined the invitation to participate because the national seashore is outside of the tribe's aboriginal homeland. No other tribes responded.

Tribes contacted in 2004:

Absentee-Shawnee Tribe of Oklahoma
Alabama-Coushatta Tribes of Texas
Alabama-Quassarte Tribal Town
Caddo Tribe of Oklahoma
Catawba Indian Nation
Cherokee Nation
Chickasaw Nation
Chitimacha Indian Tribe
Choctaw Nation of Oklahoma
Coushatta Indian Tribe
Eastern Band of Cherokee Indians
Eastern Shawnee Tribe of Oklahoma
Jena Band of Choctaw Indians
Kialegee Tribal Town
Miccosukee Indian Tribe
Mississippi Band of Choctaw Indians
Muscogee (Creek) Nation
Poarch Creek Indians
Quapaw Tribal Business Committee
Seminole Nation of Oklahoma
Seminole Tribe of Florida
Shawnee Tribe
Thlopthlocco Tribal Town
Tunica-Biloxi Tribe
Tuscarora Nation
United Keetoowah Band of Cherokee Indians

LIST OF AGENCIES, ORGANIZATIONS, AND INDIVIDUALS RECEIVING A COPY OF THIS DOCUMENT

FEDERAL AGENCIES

Advisory Council on Historic Preservation
Federal Highways Administration
U.S. Department of Defense
- Eglin Air Force Base
- Keesler Air Force Base
- Naval Air Station Pensacola
- Army Corps of Engineers
- Coast Guard

U.S. Department of Commerce
- National Oceanic and Atmospheric Administration

U.S. Department of Agriculture
- U.S. Forest Service
- Natural Resources Conservation Service

U.S. Department of the Interior
- U.S. Fish and Wildlife Service
- U.S. Geological Survey

U.S. Environmental Protection Agency

AMERICAN INDIAN TRIBAL GOVERNMENTS

Alabama-Quassarte Tribal Town
Chickasaw Nation
Choctaw Nation of Oklahoma
Jena Band of Choctaw Indians
Kialegee Tribal Town
Miccosukee Tribe of Indians of Florida
Mississippi Band of Choctaw Indians
Muscogee (Creek) Nation
Poarch Bank of Creek Indians
Seminole Nation of Oklahoma
Seminole Tribe of Florida
Thlopthlocco Tribal Town
Tunica-Biloxi Tribe of Louisiana

U.S. SENATORS AND REPRESENTATIVES

Honorable Bill Nelson, Senator (FL)
Honorable Marco Rubio, Senator (FL)
Honorable Jeff Miller, House of Representatives (FL)
Honorable Roger Wicker, Senator (MS)
Honorable Thad Cochran, Senator (MS)
Honorable Steven Palazzo, House of Representatives (MS)

STATE OFFICIALS, SENATORS, AND REPRESENTATIVES

Honorable Rick Scott, Governor (FL)
Honorable Haley Barbour, Governor (MS)
State Senator Greg Evers (FL)
State Senator Don Gaetz (FL)
State Representative Douglas Vaughn Broxson #1 (FL)
State Representative Clay Ingram #2 (FL)
State Representative Clay Ford #3 (FL)
State Representative Matt Gaetz #4 (FL)
State Senator Billy Hewes (MS)
Gulfport City Hall (MS)
Ocean Springs City Hall (MS)

STATE AGENCIES AND COMMISSIONS

Florida State Preservation Officer Scott M. Stroh, III
Mississippi State Preservation Officer T.H. Holmes
Escambia County Marine Resource
Florida Fish and Wildlife Conservation
Mississippi Department of State
Florida Department of Environmental Protection
Florida Department of Transportation
Big Lagoon State Park
Florida National Trail Association
Pensacola Beach Chamber of Commerce
Gulf Breeze Chamber of Commerce
Navarre Beach Chamber of Commerce
Santa Rosa County Chamber of Commerce
Pensacola Chamber of Commerce
Perdido Key Chamber of Commerce
Pensacola Bay Area Convention & Visitors Bureau
Fort Walton Beach Visitor Center

Biloxi Bay Chamber of Commerce
Biloxi Chamber of Commerce
Biloxi Visitor Center
D'Iberville Chamber of Commerce
Gulf Coast Chamber of Commerce
Gulfport Visitor Bureau
Hancock County Chamber of Commerce
Hancock County Tourism
Hancock Welcome Center
Harrison County Tourism Commission
Mississippi Gulf Coast Convention & Visitors Bureau
Ocean Springs Chamber of Commerce
Orange Grove Chamber of Commerce

REGIONAL, COUNTY, AND LOCAL GOVERNMENTS

City of Ocean Springs Mayor Connie Moran
City of Pensacola Mayor Ashton J. Hayward
City of Gulf Port
Escambia County Commissioners
Santa Rosa County Commissioners
Jackson County Board of Supervisors
Harrison County Board of Supervisors
City of Gulf Breeze Mayor Beverly Zimmern
Gulf Breeze City Manager Edwin "Buzz" Eddy
Santa Rosa Island Authority
Jackson County Chamber of Commerce
Jackson County Welcome Center
City of Ocean Springs Board of Aldermen

ORGANIZATIONS, BUSINESSES, AND UNIVERSITIES

University of Western Florida
Pensacola State College
University of South Alabama
Mississippi Gulf Coast Community College
Mississippi State University
University of Southern Mississippi
William Carey College
University of Southern Mississippi Research Lab
PWC Industry Association
National Parks Conservation Assoc
Gulf Coast Environmental Defense
Sierra Club
Francis M. Weston Audubon Society
Eastern National
Gulf Coast Plain Ecosystem Partnership

LIBRARIES

West Florida Regional Library
Santa Rosa County Library System
Harrison County Library System
Jackson-George Library System

SCHOOL DISTRICTS

Santa Rosa County School District
Escambia County School District
Harrison County School District
Jackson County School District
Ocean Springs County School District

CONCESSIONERS AND BUSINESSES

Dudley Food & Beverages, Inc.
Pan Isles, Inc.

NEWSPAPERS AND MAGAZINES

Pensacola News Journal
Navarre Press
North West Florida Daily News
Gulf Breeze News
Island Times
Biloxi D'Iberville Press
Clarion Ledger
Mobile Press Register
Ocean Springs Record
Sun Herald
Times-Picayune

RADIO AND TELEVISION STATIONS

WEAR TV3
WSRE TV (Public TV)
WALA TV FOX10
WKRG TV5
WPMI TV15
WUWF Radio
WCOA Radio

WYCT Cat Country 96 Radio
WLOX-TV

INDIVIDUALS

J. Earle Bowden
George Boddie
Thaddeus Cohen, Director of Community Development, City of Pensacola
Margaret Cunningham
Jerry A. Eubanks
Charlie Roose, Camp Happy Sands

APPENDIXES, SELECTED REFERENCES, PREPARERS AND CONSULTANTS, AND INDEX

GULF ISLANDS NATIONAL SEASHORE

APPENDIX A: LEGISLATION

Public Law 91-660

AN ACT

To provide for the establishment of the Gulf Islands National Seashore, in the States of Florida and Mississippi, for the recognition of certain historic values at Fort San Carlos, Fort Redoubt, Fort Barrancas, and Fort Pickens in Florida, and Fort Massachusetts in Mississippi, and for other purposes.

January 8, 1971
[H. R. 10874]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That, in order to preserve for public use and enjoyment certain areas possessing outstanding natural, historic, and recreational values, the Secretary of the Interior (hereinafter referred to as the "Secretary") may establish and administer the Gulf Islands National Seashore (hereinafter referred to as the "seashore"). The seashore shall comprise the following gulf coast islands and mainland areas, together with adjacent water areas as generally depicted on the drawing entitled "Proposed Boundary Plan, Proposed Gulf Islands National Seashore," numbered NS-GI-7100J, and dated December 1970:

Gulf Islands National Seashore. Establishment.

(1) Ship, Petit Bois, and Horn Islands in Mississippi;
(2) the eastern portion of Perdido Key in Florida;
(3) Santa Rosa Island in Florida;
(4) the Naval Live Oaks Reservation in Florida;
(5) Fort Pickens and the Fort Pickens State Park in Florida; and
(6) a tract of land in the Pensacola Naval Air Station in Florida that includes the Coast Guard Station and Lighthouse, Fort San Carlos, Fort Barrancas, and Fort Redoubt and sufficient surrounding land for proper administration and protection of the historic resources.

SEC. 2. (a) Within the boundaries of the seashore, the Secretary may acquire lands, waters, and interests therein by donation, purchase with donated or appropriated funds, or exchange, except that property owned by a State or any political subdivision thereof may be acquired only with the consent of the owner. The Secretary may acquire by any of the above methods not more than one hundred thirty-five acres of land or interests therein outside of the seashore boundaries on the mainland in the vicinity of Biloxi-Gulfport, Mississippi, for an administrative site and related facilities for access to the seashore. With the concurrence of the agency having custody thereof, any Federal property within the seashore and mainland site may be transferred without consideration to the administrative jurisdiction of the Secretary for the purposes of the seashore.

Lands, waters, acquisition.

Residential property, right of use and occupancy.

(b) With respect to improved residential property acquired for the purposes of this Act, which is beneficially owned by a natural person and which the Secretary of the Interior determines can be continued in that use for a limited period of time without undue interference with the administration, development, or public use of the seashore, the owner thereof may on the date of its acquisition by the Secretary retain a right of use and occupancy of the property for noncommercial residential purposes for a term, as the owner may elect, ending either (1) at the death of the owner or his spouse, whichever occurs later, or (2) not more than twenty-five years from the date of acquisition. Any right so retained may during its existence be transferred or assigned. The Secretary shall pay to the owner the fair market value of the property on the date of such acquisition, less their fair market value on such date of the right retained by the owner.

"Improved residential property."

(c) As used in this Act, "improved residential property" means a single-family year-round dwelling, the construction of which began before January 1, 1967, and which serves as the owner's permanent place of abode at the time of its acquisition by the United States, together with not more than three acres of land on which the dwelling and appurtenant buildings are located that the Secretary finds is reasonably necessary for the owner's continued use and occupancy of the dwelling: *Provided*, That the Secretary may exclude from improved residential property any marsh, beach, or waters and adjoining land that the Secretary deems is necessary for public access to such marsh, beach, or waters.

Termination.

(d) The Secretary may terminate a right of use and occupancy retained pursuant to this section upon his determination that such use and occupancy is being exercised in a manner not consistent with the purposes of this Act, and upon tender to the holder of the right an amount equal to the fair market value of that portion of the right which remains unexpired on the date of termination.

Hunting and fishing.

SEC. 3. The Secretary shall permit hunting and fishing on lands and waters within the seashore in accordance with applicable Federal and States laws: *Provided*, That he may designate zones where, and establish periods when, no hunting or fishing will be permitted for reasons of public safety, administration, fish or wildlife management, or public use and enjoyment. Except in emergencies, any regulations issued by the Secretary pursuant to this section shall be put into effect only after consultation with the appropriate State agencies responsible for hunting and fishing activities.

Oil and gas rights-of-way.

SEC. 4. Any acquisition of lands, waters, or interests therein shall not diminish any existing rights-of-way or easements which are necessary for the transportation of oil and gas minerals through the seashore which oil and gas minerals are removed from outside the boundaries thereof; and, the Secretary, subject to appropriate regulations for the protection of the natural and recreational values for which the seashore is established, shall permit such additional rights-of-way or easements as he deems necessary and proper.

Administration.

39 Stat. 535.

SEC. 5. Except as otherwise provided in this Act, the Secretary shall administer the seashore in accordance with the Act of August 25, 1916 (30 Stat. 535), as amended and supplemented (16 U.S.C. 1 et seq.). In the administration of the seashore the Secretary may utilize such statutory authorities available to him for the conservation and management of wildlife and natural resources as he deems appropriate to carry out the purposes of this Act. With respect to Fort Redoubt, Fort San Carlos, Fort Barrancas at Pensacola Naval Air Station, Fort Pickens on Santa Rosa Island, and Fort McRee on Perdido Key, Florida, and Fort Massachusetts on Ship Island, Mississippi, together with

such adjacent lands as the Secretary may designate, the Secretary shall administer such lands so as to recognize, preserve, and interpret their national historical significance in accordance with the Act of August 21, 1935 (49 Stat. 666; 16 U.S.C. 461–467), and he may designate them as national historic sites. The Act of July 2, 1948 (62 Stat. 1220), which provided for the establishment of the Pensacola National Monument, is hereby repealed.

Repeal. 16 USC 450gg.

SEC. 6. The Secretary of the Interior and the Secretary of the Army may cooperate in the study and formulation of plans for beach erosion control and hurricane protection of the seashore. Any such protective works or spoil deposit activities undertaken by the Chief of Engineers, Department of the Army, shall be carried out within the seashore in accordance with a plan that is acceptable to the Secretary of the Interior and that is consistent with the purposes of this Act.

Beach erosion control, study.

SEC. 7. There are hereby transferred from the National Wildlife Refuge System to the seashore the Horn Island and Petit Bois National Wildlife Refuges to be administered in accordance with the provisions of this Act.

Land transfer.

SEC. 8. Within four years from the date of the enactment of this Act, the Secretary of the Interior shall review the area within the Gulf Islands National Seashore and shall report to the President, in accordance with subsections 3 (c) and 3 (d) of the Wilderness Act (78 Stat. 890; 16 U.S.C. 1132 (c) and (d)), and recommend as to the suitability or nonsuitability of any area within the seashore for preservation as wilderness, and any designation of any such area as a wilderness shall be accomplished in accordance with said subsections of the Wilderness Act.

Review.

Report to President.

SEC. 9. No provision of this Act, or of any other Act made applicable thereby, shall be construed to affect, supersede, or modify any authority of the Department of the Army or the Chief of Engineers, with respect to navigation or related matters except as specifically provided in section 6 of this Act.

SEC. 10. There is hereby established a Gulf Islands National Seashore Advisory Commission. The Commission shall terminate ten years after the date the seashore is established pursuant to this Act. The Commission shall be composed of three members from each county in which the seashore is located, each appointed for a term of two years by the Secretary as follows:

Gulf Islands National Seashore Advisory Commission, establishment, membership.

(1) one member to be appointed from recommendations made by the county commissioners in the respective counties;

(2) one member to be appointed from recommendations made by the Governor of the State from each county; and

(3) one member to be designated by the Secretary from each county.

Provided, That two members shall be appointed to the Advisory Commission in each instance in counties whose population exceeds one hundred thousand.

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

Members of the Commission shall serve without compensation as such. The Secretary is authorized to pay the expenses reasonably incurred by the Commission in carrying out its responsibilities under this Act on vouchers signed by the Chairman.

The Secretary or his designee shall, from time to time, consult with the Commission with respect to the matters relating to the development of the Gulf Islands National Seashore.

Appropriation.

SEC. 11. There are authorized to be appropriated not more than $3,120,000 for the acquisition of lands and interests in lands and not more than $14,779,000 (1970 prices) for development, plus or minus such amounts, if any, as may be justified by reason of ordinary fluctuations in construction costs as indicated by engineering cost indices applicable to the types of construction involved herein.

Approved January 8, 1971.

APPENDIX B: LIST OF PLANT SPECIES AND SCIENTIFIC NAMES

Table B-1. List of Plant Species and Scientific Names

Common Name	Scientific Name
algae	*Euglena* spp.
American eelgrass	*Vallisneria americana*
American holly	*Ilex opaca*
Asters	*Aster* spp.
beach grass	*Panicum amarum* var. *amarulum*
beach tea	*Croton punctatus*
beech	*Fagus grandifolia*
big cordgrass	*Spartina cynosuroides*
black cherry	*Prunus serotina*
black gum	*Nyssa sylvatica*
black needlerush	*Juncus roemerianus*
bladderworts	*Utricularia* spp.
blanketflower	*Gaillardia pulchella*
blazing star	*Liatris* spp.
bluestar	*Andropogon* spp.
brittlewort	*Nitella* spp.
broomsedge	*Andropogon* spp.
buckthorn	*Bumelia* spp.
butterfly weed	*Asclepias* spp.
butterworts	*Pinguicula* spp.
buttonbush	*Cephalanthus occidentalis*
buttonweed	*Diodia virginiana*
camphorweed	*Heterotheca subaxillaris*
Carolina mosquito fern	*Azolla caroliniana*
Carolina redroot	*Lachnanthes tinctoria*
catbriar	*Smilax* spp.
Cattail	*Typha* spp.
chestnut sedge	*Fimbristylis spadicea*
Chinaberry	*Melia azedarach*
Chinese tallow	*Sapium sebiferum*
cinnamon fern	*Osmunda cinnamomea*
climbing hempweed	*Mikania scandens*
coastal morning glory	*Ipomoea trichocarpa*
coastal sand frostweed	*Helianthemum arenicola*
cogon grass	*Imperata cylindrica*
common gallberry	*Ilex glabra*
creeping centella	*Centella asiatica*
cup lichen	*Cladonia leporine*
dayflower	*Commelina erecta*
duckmeat	*Spirodela* spp.
duckweed	*Lemna* spp.
dune sandbur	*Cenchrus tribuloides*
dwarf huckleberry	*Gaylussacia dumosa*
eastern prickly pear	*Opuntia compressa*
eastern red cedar	*Juniperus virginiana*
evening primrose	*Oenothera biennis*
fetterbush	*Lyonia lucida*
fiddle-leaf morning glory	*Ipomoea stolonifera*
fingergrass	*Eustachys petraea*
flowering dogwood	*Cornus florida*
frog's bit	*Limnobium spongia*
gallberry	*Ilex glabra*
glasswort	*Salicornia* spp.

Common Name	Scientific Name
goldenrod	*Solidago* spp.
grape	*Vitis* spp.
groundsel	*Baccharis halimifolia*
Gulf muhly grass	*Muhlenbergia capillaries*
Hercules'-club	*Zanthoxylum clava-heculis*
horse sugar	*Symplocus tinctoria*
horseweed	*Conyza canadensis* var. *pusillus*
huckleberry	*Gaylussacia frondosa*
Japanese climbing fern	*Lygodium japonicum*
Japanese honeysuckle	*Lonicera japonica*
Japanese privet hedges	*Ligustrum japonicum*
knotroot bristlegrass	*Setaria geniculata*
kudzu	*Pueraria montana*
lance-leaved arrowhead	*Sagittaria lancifolia*
lantana	*Lantana spp.*
large gallberry	*Ilex coriacea*
large headed rush	*Juncus megacephalus*
laurel oak	*Quercus hemispherica*
laurel-leaf greenbrier	*Smilax laurifolia*
Le Conte's flatsedge	*Cyperus lecontei*
leafy bulrush	*Scirpus robustus*
little bluestem	*Schizachyrium scoparium*
live oak	*Quercus virginiana*
lizard's tail	*Saururus cernuus*
loblolly pine	*Pinus taeda*
longleaf pine	*Pinus palustris*
loosestrife	*Lythrum lineare*
love-grass	*Eragrostis pilosa*
manatee grass	*Cymodocea filiformis*
maritime bluestem	*Schizachyrium littorale*
marsh elder	*Iva frutescens*
marsh fleabane	*Pluchea odorata*
marsh hay	*Spartina patens*
marsh pennywort	*Hydrocotyle umbellata*
marsh pink	*Sabatia stellaris*
mimosa	*Albizia julibrissin*
muhly grass	*Muhlenbergia* spp.
muskgrass	*Chara* spp.
narrow-leaved pinweed	*Lechea patula*
needlepod rush	*Juncus scirpoides*
netted chain fern	*Woodwardia areolata*
nodding ladies tresses	*Spiranthes vernalis*
palmetto	*Sabal minor*
pampas grass	*Cortaderia selloana*
panic grasses	*Panicum* spp.
panicum	*Panicum aciculare*
paspalum	*Paspalum* spp.
pepper-vine	*Ampelopsis arborea*
perennial glasswort	*Sarcocornia perennis*
pignut hickory	*Carya glabra*
pitcher plants	*Sarracenia* spp.
poison ivy	*Toxicodendron radicans*
post oak	*Quercus stellata*
prostrate cup lichen	*Cladonia prostrata*
railroad vine	*Ipomoea brasiliensis*
rattle box	*Sesbania punicea*
red bay	*Persea palustris*
red maple	*Acer rubrum*

Common Name	Scientific Name
redroot	*Lacnanthes caroliniana*
rosemary	*Ceratiola ericoides*
rough buttonweed	*Diodia teres*
royal fern	*Osmunda regalis*
running oak	*Quercus pumila*
salt grass	*Distichlis spicata*
salt marsh aster	*Aster tenuifolius*
salt marsh bulrush	*Scirpus robustus*
salt marsh morning-glory	*Ipomoea sagittata*
saltwort	*Batis maritime*
Gulf Coast swallow-wort	*Cynanchum angustifolia*
saw palmetto	*Serenoa repens*
sawgrass	*Cladium jamaicensis*
sea lavender	*Limnonium carolinianum*
sea oats	*Uniola paniculata*
sea ox-eye	*Borrichia frutescens*
sea purslane	*Sesuvium portulacastrum*
sea rocket	*Cakile constricta*
sea-beach atriplex	*Atriplex arenaria*
seashore elder	*Iva imbricata*
seaside goldenrod	*Solidago sempervirens*
seaside pennywort	*Hydrocotyle bonariensis*
seaside sandmat	*Chamaesyce polygonifolia*
seaside spurge	*Chamaesyce polygonifolia*
sedge family	*Cyperaceae*
Shoal grass	*Halodule wrightii*
slash pine	*Pinus elliioti*
smooth cordgrass	*Spartina alternifolia*
smooth water hyssop	*Bacopa monnieri*
southern beeblossom	*Guara angustifolia*
southern magnolia	*Magnolia grandiflora*
southern red oak	*Quercus falcata*
southern umbrella-sedge	*Fuirena scirpoidea*
sphagnum moss	*Sphagnum* spp.
squaw huckleberry	*Vaccinium stamineum*
St. John's wort	*Hypericum reductum*
star grass	*Halophila engelmannii*
sundews	*Drosera* spp.
sundrops	*Oenothera fruticosa*
swamp black gum	*Nyssa biflora*
swamp rose mallow	*Hibiscus moscheutos*
swamp titi	*Cyrilla racemiflora*
sweet bay magnolia	*Magnolia virginiana*
sweetgum	*Liquidambar styraciflua*
tape grass	*Vallisneria Americana*
three square bulrush	*Scirpus americanus*
toothache grass	*Ctenium aromaticum*
torpedo grass	*Panicum repens*
tree huckleberry	*Vaccinium arboretum*
turtle grass	*Thalassia testudinum*
vine	*Cynanchum palustre*
Virginia creeper	*Parthenocissus quinquefolia*
water hyacinth	*Eichhornia crassipes*
water oak	*Quercus nigra*
water smartweed	*Polygonum punctatum*
wax myrtle	*Merica cerifera*
wax myrtle	*Myrica cerifera*
white oak	*Quecus alba*

Common Name	Scientific Name
white top sedge	*Dichromena* spp.
widgeongrass	*Ruppia maritima*
wild bean	*Strophostyles helvola*
wild lettuce	*Lactuca canadensis*
winged sumac	*Rhus copallina*
wiregrass	*Aristida stricta* and *A. palustris*
wiregrass	*Aristida stricta*
yaupon	*Ilex vomitoria*
yellow buttons	*Balduina angustifolia*
yellow pond lily	*Nuphar luteum*
yellow top pitcher plant	*Sarracenia alata*
yellow-eyed grass	*Xyris elliottii*

APPENDIX C: DETERMINATION OF IMPAIRMENT

Gulf Islands National Seashore General Management Plan / Environmental Impact Statement

A determination of impairment is made for each of the resource impact topics carried forward and analyzed in the environmental impact statement for the preferred alternative. The description of national seashore's significance in chapter 1 was used as a basis for determining if a resource is

- necessary to fulfill specific purposes identified in the establishing legislation of the national seashore, or
- key to the natural or cultural integrity of the national seashore or to opportunities for enjoyment of the national seashore, or
- identified in the national seashore's general management plan or other relevant NPS planning documents as being of significance.

A determination of impairment is not required for the impact topics of visitor use and experience, social and economic environment, or NPS operations because impairment findings relate back to national seashore resources and values. These impact areas are not generally considered to be resources or values according to the Organic Act and cannot be impaired in the same way that an action can impair resources and values.

CULTURAL RESOURCE TOPICS

Historic Structures

Gulf Islands National Seashore contains forts, artillery batteries, and other important military structures that span the time from the Civil War to World War II. On Perdido Key and Santa Rosa Island in the Florida Unit, there are four 19th century forts that were built to defend Pensacola Bay: Fort Pickens, Fort Barrancas, Fort McRee, and Advanced Redoubt. Another historically significant fort, Fort Massachusetts, is on Ship Island in the Mississippi Unit. Fort Barrancas, Fort Pickens, and Fort Massachusetts are listed in the National Register of Historic Places. The national seashore has 62 structures on its List of Classified Structures, many of which support the area's significance in preserving coastal fortifications and military defense. Other important historic structures in the national seashore not associated with the military are several Civilian Conservation Corps buildings at Davis Bayou and the Fort Pickens Ranger Station in the Fort Pickens National Register boundary.

The preservation of historic structures is key to maintaining the cultural integrity of the national seashore and historic structures are identified in the establishing legislation for the national seashore. The actions in the preferred alternative would result in impacts on historic structures and buildings that would be localized, long term to permanent, and beneficial. Rehabilitation, preservation, and adaptive reuse of historic structures would help to maintain, and in some cases improve, their current condition. Because there would be no adverse effects on historic structures, the preferred alternative would not result in impairment.

NATURAL RESOURCE TOPICS

Geologic Processes

The national seashore encompasses barrier islands and coastal mainland in Florida and Mississippi. Natural barrier island processes of erosion and accretion are well represented in both areas. Many of the areas were formed during the late Pleistocene and Holocene epochs about 11,000 years ago, and sedimentation and subsidence processes continue to this day. Episodic hurricane destruction and island segmentation has played an essential role in the evolution of all the islands in the

national seashore. However, human-induced changes to sediment transport, such as dredging around the islands and alterations of the river delta systems north of the national seashore, have altered the natural resilience of the islands to move and recover from severe storms.

Geologic processes are central component of the barrier island ecosystem and as such contribute to the natural integrity of the national seashore. The actions in the preferred alternative would have some localized adverse effects on geologic processes, such as the presence of the Fort Pickens Road, which disrupts natural barrier island migration and might introduce debris if it is destroyed in future storms. If the Johnson Beach Road were not replaced following a severely destructive storm, this would have positive impacts on geologic processes in that area by allowing natural barrier island processes such as dune formation and migration to occur. Other actions in the preferred alternative would support sediment transport, protect sediment processes in seagrass beds, and restore natural flows of water through mainland areas with positive effects on geologic processes. Overall, the actions in the preferred alternative would have beneficial effects on geologic processes in the national seashore and would not result in impairment.

Soils

Soils at Gulf Islands National Seashore are largely maritime in origin. Beaches were deposited by the action of tides, waves, and currents of the Gulf of Mexico. Some soils were deposited and formed by alluvial outwash from river deltas to the north. Soils in the national seashore are generally weathered, with high acidity and low fertility. Soils on the barrier islands and beaches are almost entirely quartz sand with varying amounts of clay, silt, and shell fragments. In locations where plant material has accumulated, such as on sand dunes or near ponds and lagoons, some organic content might develop. Low-lying mainland soils, such as at Davis Bayou, are young soils still forming from accumulation and decomposition of organic material from grasses and marsh vegetation.

Soils are central component of the barrier island ecosystem and as such contribute to the natural integrity of the national seashore. The actions in the preferred alternative would have localized adverse impacts, such as soil disturbance during construction of restroom facilities at Perdido Key. However, overall the actions would have negligible or beneficial impacts, such as instituting a camping permit system on some islands, which would lessen visitor impacts on soils, or replacing pavement with more permeable surfaces in some locations, which would reduce erosion. Because the limited adverse impacts on some soils would be highly localized and short in duration, and other impacts would be beneficial and long in duration, the preferred alternative would not result in impairment of soil resources.

Water Quality

More than 80% of the area of the national seashore is submerged land, so water quality is strongly connected to natural resources and visitor enjoyment. The major influence on water quality is land use in the contributing watersheds, leading to problems such as pollutant loading in stormwater runoff, changes in groundwater recharge rates, and sewage effluent. Water quality is also affected by oil and gas emissions from watercraft, ranging from small personal watercraft to large transport ships. The Loop Current in the Gulf of Mexico brings warm currents northward into the Gulf through the Yucatan Channel and then eastward through the Florida Straits. Thus, water quality and water movement in the national seashore can be influenced by local as well as far-reaching land and water activities. Water quality in the national seashore is considered suitable for recreational purposes and for the maintenance of fish and wildlife populations. Florida waters in the national seashore are not suitable for shellfish harvesting, although the Mississippi waters are suitable for shellfish harvesting. The states of Florida and Missis-

sippi are responsible for water quality monitoring in their respective waters, although the National Park Service is a partner in water quality monitoring and reporting, especially with respect to recreational uses.

High water quality is a central component of the barrier island ecosystem and as such contributes to the natural integrity of the national seashore Water quality also impacts opportunities for visitors to enjoy the national seashore because most recreational opportunities are water-based or have some connection to the Gulf of Mexico. The actions in the preferred alternative would have overwhelmingly beneficial, long-term impacts on water quality. Some adverse impacts on water quality might occur, such as a possible increase in visitor use, boat traffic, and waste generation on several barrier islands, but these impacts would be highly localized, and visitor education might mitigate some of the impacts. However, many actions in the preferred alternative would have beneficial effects on water quality, such as the development of a marine management program, the replacement of pavement with permeable surfaces, the filling of an abandoned well on West Ship Island, and improving sanitation facilities near the Pensacola Naval Air Station sites. Overall, the actions of the preferred alternative would have long-term, beneficial effects on water quality and would not result in impairment.

Wetlands

Much of the vegetation between the ocean and the uplands at Gulf Islands National Seashore is considered tidal marsh, discussed in the "Terrestrial Vegetation and Wildlife" discussion in chapter 3. However, hydric soils and emergent wetland vegetation has become more prevalent following the hurricanes in the past decades. In the Florida District, wetlands became established in the Okaloosa Area after Hurricane Opal in 1995. Other wetlands have become established near Fort Pickens following the 2004 and 2005 storms. Davis Bayou and Cat, Horn, and West Ship islands also have natural wetland vegetation.

Wetlands are an important component of the barrier island ecosystem and as such contribute to the natural integrity of the national seashore. The actions in the preferred alternative would have beneficial impacts on wetlands, such as wetland restoration work on Cat Island. Slight adverse impacts on wetlands might occur if the Fort Pickens Road were rebuilt after a destructive storm, depending on the location of wetland vegetation in relation to storm damage. The National Park Service adheres to a "no net loss" of wetlands policy and abides by other federal and agency wetlands policies. A "Statement of Findings" would be prepared should the implementation of any component of this general management plan result in adverse impacts on wetlands. Further environmental compliance and permitting is expected during project implementation per National Park Service and U.S. Army Corps of Engineers requirements. Because of the largely beneficial effects and only slight, localized, potential adverse effects on wetlands, the preferred alternative would not result in impairment of wetlands in the national seashore.

Terrestrial Vegetation and Wildlife

Gulf Islands National Seashore contains a great diversity of terrestrial vegetation among the barrier islands and mainland ecosystems. Tidal salt marshes, lagoons, shrub and thicket, swamps, dunes, maritime and hardwood forest, pine woods, and beaches all support vegetation that ranges from salt-tolerant grasses to live oak trees. Other dominant terrestrial plants include longleaf pine, smooth cordgrass, bulrushes, sedges, and sea oats. In general, the salinity level and inundation of the soil dictates what species can inhabit a specific site. Because of the dynamic nature of the coastal and barrier island environments, terrestrial vegetation on the islands and along the water's edge can vary dramatically from year to year depending on storm cycles and flooding and drying periods.

Wildlife in the terrestrial environment includes numerous shorebirds, amphibians, and reptiles. A variety of terns, clapper rails,

osprey, bald eagles, and herons are among the common birds found in the national seashore. Seasonal closures are instituted in some areas to protect the nests of these birds from human disturbance. Common amphibians and reptiles include the eastern glass lizard, five-lined skink, and alligator snapping turtle.

Terrestrial vegetation and wildlife are important components of the barrier island ecosystem and as such contribute to the natural integrity of the national seashore. In addition, they provide benefits for visitor enjoyment of the national seashore. The primary adverse impacts of the preferred alternative would be limited to short-term disturbance of habitat in several locations, such as the burying of utility lines at Naval Live Oaks. However, most impacts on wildlife and terrestrial vegetation would be long term and beneficial, such as instituting a camping permit system for some of the barrier islands that would allow for better visitor education and visitor use management. Because there would only be slight, localized, adverse impacts and long-term beneficial impacts, the preferred alternative would not result in impairment of terrestrial vegetation and wildlife.

Aquatic Vegetation and Wildlife

The national seashore contains large expanses of seagrasses, which thrive in areas up to 12 feet deep that have sandy bottoms and calm waters. These seagrass communities form the basis of the food web in the marine ecosystem and provide cover and nursery habitat for many species. Although the seagrasses make up a small percentage of the total submerged lands around the national seashore, they support a disproportionately large diversity of species. Seagrass beds are susceptible to degradation from propeller scarring, dredging activities, pollution and nutrient loading, boat traffic, and shoreline modification. Natural events such as storms, changes in salinity, and sediment transport also affect seagrass bed ecosystems.

Aquatic species in the national seashore inhabit both estuarine and marine habitats. More than 200 species of fish are found in the national seashore, including killifish, sailfin molly, and mosquito fish. These predators rely on the most abundant fishes, anchovies and silversides, as a food source. Other important species include channel bass, speckled sea trout, flounder, snapper, tarpon, and mullet. Several species of sharks and rays are found in the national seashore, as are many shellfish including blue crabs, shrimp, and stone crabs.

Aquatic plants and wildlife are central components of the barrier island ecosystem and as such contribute to the natural integrity of the national seashore. The preferred alternative would result in adverse impacts on these resources in areas where boat traffic and human activity might increase, such as ferries near Davis Bayou or increased boat access to Cat Island. However, the institution of a seagrass bed protection zone in many areas of the national seashore would provide substantial long-term beneficial impacts on seagrasses, other aquatic plant species, and the wildlife species that inhabit these ecosystems. Additionally, the development of a marine management program under this alternative would provide better information for management of aquatic plants and wildlife. Overall, the adverse impacts would be slight and localized, and the beneficial impacts would be widespread and long term. The preferred alternative would therefore not result in impairment of aquatic plants and wildlife.

Special Status Species

The Endangered Species Act requires federal agencies to ensure that their activities would not jeopardize the existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat of such species. As a matter of policy, the National Park Service also supports the conservation of the populations and habitats of state listed species of concern. Consultation with the U.S. Fish and Wildlife Service; the National Marine Fisheries

Service; the Florida Fish and Wildlife Conservation Commission; and the Mississippi Department of Fish, Wildlife, and Parks identified a number of threatened, endangered, or species of concern in the national seashore. Federally listed species in the national seashore include the Perdido Key beach mouse, West Indian manatee, American alligator, four species of sea turtle, Eastern indigo snake, gopher tortoise, wood stork, and Mississippi sandhill crane. State species of special concern include the saltmarsh topminnow, Gulf salt marsh snake, Stoddard's yellow-throated warbler, Bachman's sparrow, peregrine falcon, least tern, Santa Rosa beach mouse, and Cruise's golden aster.

Viable populations of species of concern, including both federal and state listed species, are central components of the barrier island ecosystem and as such contribute to the natural integrity of the national seashore. The actions in the preferred alternative would have slight adverse impacts on several listed species. For example, increased human use in the Naval Live Oaks Area might impact the gopher tortoise, and increased activity near Johnson Beach might impact the Perdido Key beach mouse. In other locations, long-term beneficial impacts to species of concern would be expected because of the regulation of camping and continuation of bird nesting closures. In all cases the National Park Service would continue working with the federal and state agencies responsible for listing these species to develop mitigative measures for population and habitat protection. Because of the localized nature of the adverse impacts, widespread beneficial impacts, and continued consultation with cooperating agencies, the preferred alternative would not result in impairment of special status species.

SUMMARY

As described above, adverse impacts anticipated as a result of implementing the preferred alternative on a resource or value whose conservation is necessary to fulfill specific purposes identified in the establishing legislation of the national seashore, key to the natural or cultural integrity of the national seashore or to opportunities for enjoyment of the national seashore, or identified as significant in the national seashore's general management plan or other relevant NPS planning documents would not rise to levels that would constitute impairment.

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

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