National Park Service
U.S. Department of the Interior

Cumberland Island National Seashore

Fire Management Plan
Environmental Assessment

October 2013

Prepared for:
National Park Service
U.S. Department of Interior
Cumberland Island National Seashore
Camden, Georgia

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Summary

Cumberland Island National Seashore is proposing to update their Fire Management Plan (FMP) to include prescribed burning, use of manual and mechanical tools for vegetation management, wildland fire managed for resource objectives, and targeted herbicide application for fuels management and restoration. A revised FMP is needed due to the need to better protect island structures, facilities, and values; the need to restore fire to its natural role in the ecology of Cumberland Island; the discontinued use of the Healthy Forest Initiative Categorical Exclusion; and the need to update National Fire Policy changes in terminology. Due to updates in environmental regulations and the proposed use of these fire management tools, the National Park Service (NPS) has determined that it is necessary to complete a NEPA analysis.

This Environmental Assessment (EA) evaluates 3 alternatives—a No Action Alternative (1), and two action alternatives (2–3), including the Preferred Alternative. Under the No Action Alternative, the fire management program would continue to use the presently approved fire management tools (i.e., wildfire management and suppression) under National Fire Policy. Prescribed burns, use of manual and mechanical tools for vegetation/fuel reduction activities, wildfire managed for resource objectives, and targeted herbicide use would not be utilized in ecological restoration, maintenance, or hazard fuel reduction activities unless separate, project specific NEPA processes occurred, which would be costly and time intensive. This would make restoration efforts and maintaining defensible space more difficult and require more time to accomplish; continue to reduce resilience of Cumberland Island National Seashore ecosystems to hurricanes, drought, pest outbreaks, and wildfire; and continue retention and increased density of hazardous fuels. The Action Alternative 2 would continue using the presently approved wildfire management and suppression tools with the addition of prescribed burning, use of manual and mechanical tools for vegetation/fuel reduction activities, wildfire managed for resource objectives, and targeted herbicide application. Use of these fire management tools would be new to Cumberland Island National Seashore and would more effectively restore and protect Cumberland Island National Seashore values and fire-dependent ecosystems to the maximum extent possible, increase success in developing and maintaining defensible space by reducing hazardous fuels, and make prescribed burn implementation safer. Action Alternative 3 would be the same as Action Alternative 2 except that mechanical treatments would not be used in the Seashore Wilderness area. Each alternative is described in more detail in the "Alternatives Considered" section of this document.

This EA has been prepared in compliance with the National Environmental Policy Act (NEPA) to provide the decision-making framework that: 1) analyzes a reasonable range of alternatives to meet objectives of the proposed plan; 2) evaluates potential issues and impacts to the natural and cultural resources of Cumberland Island National Seashore; and 3) identifies specific and required mitigation measures that are designed to lessen the degree or extent of these impacts. Resource topics

determined to potentially be affected by the alternatives include: Air Quality, Geologic and Soil Resources, Vegetation Resources (including Invasive Weeds), Wildlife, Special Status Species, Water Resources, Riparian/Wetlands, Cultural and Historic Resources, Wilderness, Soundscapes, Park Operations, Visitor Use and Experience, and Human Health and Safety. All other resource topics were dismissed because it was determined the action alternatives would result in negligible to less than minor effects. No major effects were identified as a result of this project. No adverse effects on cultural resources under Section 106 of the National Historic Preservation Act would occur. Public scoping was conducted to assist with the development of this document and development of the alternatives; comments were received and considered in the evaluation of effects.

Procedural History

External scoping for the FMP update and EA was pursued through the distribution of an informative brochure, including distribution to the Park's stakeholders via mail and email. In addition, a press release was sent to local and regional media; information was posted on the Park website; and the project was set up for review and comment in the NPS Planning, Environment, and Public Comment website (PEPC). Two open house style meetings were also conducted to offer further opportunities for the public and various agencies to gather information of the proposed addition of prescribed burning, the use of manual and mechanical tools, and targeted herbicide application as fire management tools, and to solicit feedback for direction in the EA. The scoping letter dated October 16, 2012 was mailed to various private landowners, federal and state agencies, and affiliated Native American tribes. Public meetings were held on November 19th and 20th 2012, in St. Marys and at Cumberland Island, Georgia. During the meeting, NPS representatives were available to present an overview of the proposed actions and answer questions; attendees were able to submit oral and written comments or write in later, depending on their preference. A total of 10 people attended the meetings. Two comment cards were generated from the meetings, and four persons provided comments via e-mail and regular mail.

The Cumberland Island National Seashore Fire Management Plan Environmental Assessment will be available for public comments for 30 days. Reviewers should provide the NPS with their comments on the EA during the review period. This will allow NPS to analyze and respond to comments at one time, thus avoiding undue delay in the decision-making process. Reviewers are encouraged to structure their participation in the National Environmental Policy Act process so that it is meaningful and alerts the agency to the reviewer's position and contentions. Comments on the EA should be specific and should address the adequacy of the analysis and the merits of the alternatives discussed (40 CFR 1503.3).

Comments on this EA must be delivered or postmarked no later than November 29, 2013.
If you wish to comment on this EA, electronic comments are preferred. The National Park Service's Planning, Environment, and Public Comment (PEPC) web site and an email address are both available for this purpose:

PEPC: http://parkplanning.nps.gov/cuis
E-mail: CUIS_Planning@nps.gov.

Mailing Address: Superintendent, Cumberland Island National Seashore, 101 Wheeler Street, St. Marys, Georgia 31558

Important Notice: 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. While 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.

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1.0 PURPOSE AND NEED

1.1 Introduction

Cumberland Island National Seashore (hereafter Seashore) is the southernmost barrier island along the Georgia coastline in Camden County. It is separated from the mainland by the Cumberland River, which is part of the Intracoastal Waterway (Figure 1). The island is 17.5 miles long, ranging from just over a half mile to three miles wide, and totals 36,415 acres of which 16,850 are marsh, mud flats, and tidal creeks. The northern portion includes 9,886 acres of designated wilderness, while an additional 10,500 acres are classified as potential wilderness. Most of the island's uplands are federally owned and managed by the National Park Service. The remaining portions of the island are state owned, privately owned, or owned by other federal entities. Some of the NPS lands are held under reserved estate agreements by private entities.

Little Cumberland Island while within the Seashore's boundaries is all private land. The Little Cumberland Island Home Owners Association governs the use of the land while the Georgia Forestry Commission and Camden County Fire and Rescue share fire protection responsibilities. The Seashore serves as a cooperating agency in fire events. Private lands are also located in the mid-section of Cumberland Island around the Stafford area and further to the south between the Greyfield and Sea Camp areas. Reserved estate properties are located throughout the Seashore. Their associated agreements are all life estates that establish rights of use and occupancy until they expire, whereupon they will revert to full government possession.

The Seashore contains 22 plant communities that have been mapped and described (Hillestad et al. 1975). Of these plant communities, most of the upland forest habitats are classified as "fire-adapted," inter-related relationships where the plants and animals are adapted to periodic wildfires to support their renewal, survival, and ecological integrity. Vegetation within the Seashore is closely related to soil type, past land use, and fire history. There are approximately 29,162 acres of flammable vegetation within the Seashore perimeter. Vegetation on the Seashore consists of marshlands, live oak hammocks, pine stands, palmetto, swamps, and coastal brush species. Successive waves of human habitation (4000 years), and especially Euro-American influence (400 years), have greatly shaped the vegetation and wildlife communities (Dilsaver 2004, Zomlefer et al. 2008).

Historically wildfires helped shape the native vegetation and ecosystems of the Seashore (Van Lear and Waldrop 1989, Frost 1998). Before Euro-American settlement, the fire regime was driven primarily by lightning-induced fires and second by Native Americans. The island was settled and utilized by Native Americans of the Tacatacura culture upon Euro-American arrival in the 16th century. Native Americans burned areas where lightning ignitions were lower (Pyne 1995), in portions of the landscape that were naturally isolated from fires on uplands, or in more dissected topographic regions where lightning ignitions were high but fire extent were small (Frost 2011). Native Americans burned to clear lands for agriculture, to gather nuts, and other uses (Frost 2011). Longleaf pine (*Pinus palustris*), live oak (*Quercus virginiana*), and slash pine (*P. elliotti*) dominated the landscape with open grassy savanna conditions in the central and northern uplands. Low intensity surface fires frequented the broad uplands, ridges, and dry south slopes every 1–6 years, renewing grasses, reducing brush and woody debris while fire dependent species thrived in open stand conditions (Frost 2011). The fire sheltered vegetation communities (e.g., live oak) burned infrequently or only partially with low severity understory fires. Wildfire cycles were related to drought cycles and occurrence of dry lightning (Turner and Bratton 1987). The Seashore was and is

a diverse environment where the distribution of vegetation types was controlled by the interaction between topography, vegetation, water, soils, and local climate, especially humidity. The fires created niches for wildlife and plant species that are now at risk of being lost due to species and vegetation structure changes wrought by fire exclusion.

Euro-American settlement brought great modifications to the environment of the Seashore. From the 1600's to the present logging, livestock grazing, clearing, settlement, farming, and road building all brought localized changes.

Logging of pine and live oak (*Quercus virginiana*) began in the 1600s, but became prevalent after the British occupation in the 1750s as the live oak was especially prized for shipbuilding. Agricultural fields, livestock, and plantations were common by the 1850s. As the pine and live oak forests were fragmented by logging activities and land clearing for agricultural development and settlements, wildfires were controlled and reduced. Some intentional burning by landowners was an acceptable vegetation clearing activity in localized island areas until the mid-20th century (Turner and Bratton 1987). The unbridled regrowth of vegetation in the relatively warm, humid environment and the suppression of fire in the last half-century have created a burst of vegetation on the island. It has altered the recovering ecosystems some of which are fire dependent, by preventing the periodic, frequent interruption and renewal by wildfire (Johnson et al. 1974). Fire history studies indicate that high severity, stand replacing wildfires were rare until effective fire suppression from the 1950s to the present (Frost 2000).

Decades of fire suppression prior to the Seashore's creation resulted in numerous vegetation changes—from fire dependent communities such as open pine savannas and scrub oak barrens, to mixed pine and hardwood forest with dense brush ground cover, or toward sloughs with dense brush understory. Replaced were predominant open-stand longleaf pine stands and/or mature hardwood forests with herbaceous or grassy ground cover. Fire exclusion in the pine savanna habitats has further enabled succession of the sites to oak hammock vegetation. In contrast, due to the difficulty of containing high intensity fires burning in scrub habitats, the distribution of scrub vegetation compared to mesic hammock vegetation is closer to what was likely its natural distribution. The absence of fire disrupted natural plant succession processes that are dependent upon periodic renewal by wildfire (Means et al. 2004, Owen and Brown 2005, Waldrop et al. 1991). The natural vegetation communities have been recovering from abandoned agricultural fields and habitats previously subjected to grazing and selective pine harvest reverting to a semi-natural condition (Hillestad et al. 1975).

In accordance with NPS 2006 Management Policies, the Seashore fire management plan will be designed to protect the health and safety of the public and employees; minimize potential impacts associated with fire to private or reserved estates properties and to park facilities and infrastructure; and protect, preserve, and enhance natural and cultural resources. The preservation of natural and cultural resources within the Seashore is fundamental to its continued use and enjoyment by park visitors as a national seashore with natural resource values preserved as part of the National Park System.

The new FMP would affirm firefighter and public safety as the highest priority of every fire management activity. In addition, the new FMP would incorporate updated terminology related to National Fire Policy.

Description of the Park

The Seashore was created by Congress in 1972 (Public Law (PL) 92-536, codified at 16 U.S.C. 459i *et seq*. (the Act) "to provide for public outdoor recreation use and enjoyment of certain significant shoreline lands and waters of the United States and to preserve related scenic, scientific, and historical values". On September 8, 1982, much of the northern half of Cumberland Island was designated as wilderness or potential wilderness to be managed as part of the National Wilderness Preservation System (PL 97-250, as amended by PL 108-447, 16 U.S.C. 1131 *et seq*.). In 1986, the diverse resources on the Seashore were recognized when the UNESCO Bureau of the International Coordinating Council for Man and the Biosphere designated the Seashore as part of the Carolina-South Atlantic Biosphere Reserve-Sea Island Unit. The Seashore presently includes Little Cumberland (private ownership) and Great Cumberland islands (most of the NPS lands, but also includes private and reserved estates properties), the surrounding tidelands, marshes, and beaches, and some minor undeveloped islets. Great Cumberland is the southern portion of the Seashore and makes up the majority of the actively managed portion of the Seashore.

The Seashore's undeveloped natural areas attract visitors for activities such as swimming, camping, backpacking, fishing, hiking, bird and wildlife watching and beachcombing. Archeological features, such as shell middens, are evidence of pre-historic human habitation on the island as far back as 4,000 years before present. Buildings, landscape features, structural ruins and archeological sites depict a historical record of the island through the colonial times, the plantation era, and to the present day. These historic remains including mansions and their associated settlements, churches, cemeteries, and African-American settlements, draw visitors.

During dry periods when vegetation is flammable, private property is at risk from wildland fires. Some areas within the Seashore remain in full private ownership, while additional areas constitute what are often referred to as "reserved estates". These reserved estates are in use by private entities but will convert to full government possession after the reserve agreements, which are all life estates, expire. The Seashore also includes ruins of historic homes, docks, cemeteries, ruins of slave quarters, and hotels.

The climate is moderately subtropical with hot, humid summers and mild, short winters. The annual temperature is 68.6ºF with a mean summer temperature of 81ºF and a mean winter temperature of 54ºF. Annual relative humidity averages are 90% in the morning and 60% in the afternoon. Average annual precipitation is 51 inches with heavy rainfall in September–October often associated with hurricane conditions (Zomlefer et al. 2008).

1.2 Purpose and Need

This Environmental Assessment (EA) has been prepared in compliance with the National Environmental Policy Act (NEPA), National Historic Preservation Act (NHPA), regulations of the Council on Environmental Quality (CEQ) (40 CFR §1508.9), and the (NPS) Director's Order (DO) 12 to provide the decision-making framework that:

1) Analyzes a reasonable range of alternatives to meet the objectives for a proposed new Fire Management Plan (FMP);

2) Evaluates potential issues and impacts to the natural and cultural resources of Cumberland Island National Seashore; and

3) Identifies specific and general mitigation measures that are designed to lessen the degree or extent of these impacts.

1.2.1 Purpose

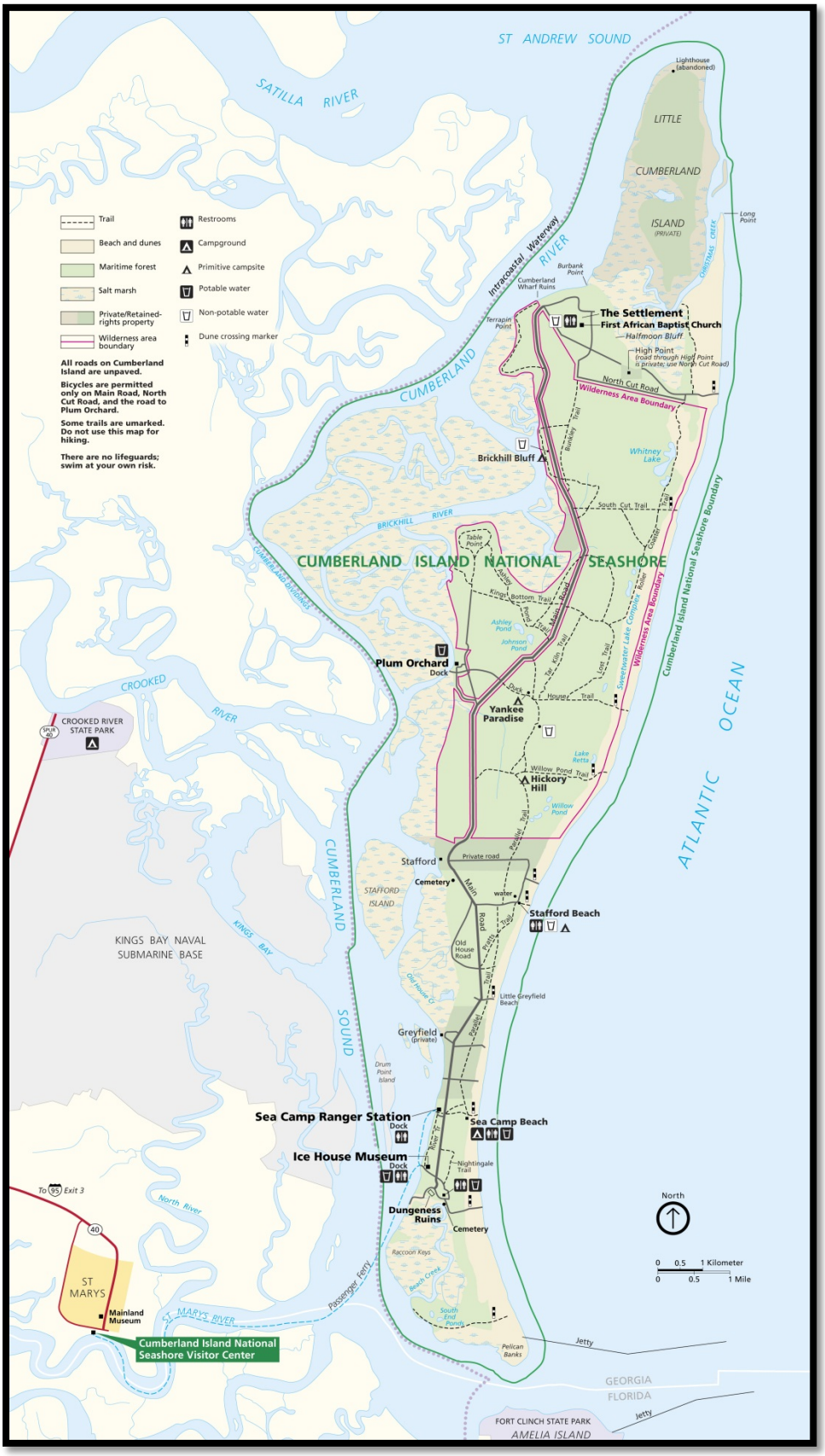
The purpose of the proposed project is to comply with DO-18, Wildland Fire Management, which states that "all parks with vegetation that can sustain fire must have a fire management plan", and to replace the use of the Healthy Forest Initiative Categorical Exclusion (CE), per NPS direction to discontinue the use of that CE.

1.2.2 Need

The Seashore is proposing to update their FMP for two basic reasons; 1) research and knowledge of Seashore lands and resources indicate more active management of vegetation is necessary to protect, maintain, and perpetuate Seashore values, and 2) as of 2015 the NPS will no longer base management actions on the Hazardous Fuels Categorical Exclusion (CE) which will invalidate many of the activities in its 2004 FMP. The NPS proposes to include more active fire management strategy activities in its new FMP such as prescribed burning, wildfire managed for resource objectives (i.e., in limited areas and under certain conditions), and targeted herbicide use. A new FMP is needed to better protect island visitors, residents, structures, facilities, and natural and cultural resource values; the need to restore fire to its natural role in the ecology of Cumberland Island; and the need to update language in the plan to follow National Fire Policy terminology changes. Seashore fire management includes planning, preparedness, prevention, suppression, restoration and rehabilitation, and education; all are conducted on an interagency basis and frequently involve cooperators and partners.

Since completion of its 2004 FMP, the Seashore has utilized fire suppression on a number of small and one large fire in 2008; done some limited mechanical and manual fuel treatments to create and/or maintain defensible space for structures within the park; hired a dedicated Fire Management Officer (FMO); facilitated additional fire related research and monitoring; and developed relationships with interagency fire partners. The Seashore plans to continue mechanical and manual fuel treatments, but has learned that these types of treatments alone cannot effectively reduce the widespread island buildup of hazardous vegetative fuels, accomplish ecological restoration, or effectively maintain unique ecosystems (e.g., longleaf pine savanna, pine and oak scrub, freshwater wetlands). Use of only mechanical and manual fuel treatments would not help restore wilderness and natural values, all-important values identified in the Seashore's legislation. The continued retention and buildup of hazardous vegetative fuels could lead to the reduced resilience of Seashore fire-adapted ecosystems to continued stress from hurricanes, drought and climate change, pest outbreaks, and wildfire.

Figure 1. Vicinity Map of Cumberland Island Natural Seashore



Pre-park human practices including logging, grazing, farming, and settlement clearing activities plus fire suppression efforts have allowed the growth and buildup of dense, understory vegetation in fire-dependent plant communities. This has led to a trend of increasing size and intensity of actual and potential wildfires. Future intense wildfires may threaten island structures, improvements, cultural resources, ecosystems, and residences.

Safe attack and suppression of these fires has become increasingly difficult, costly, and risky to firefighters due to the lack of good safety zones, the lack of effective barriers to help stop fire in thick vegetation, and delayed availability of suppression resources due to the difficulties of access and remoteness of the island. Fire exclusion has led to changes in species composition and vegetation structure, making it difficult to retain and restore traditional and historic island vegetation types and habitats. The change in vegetation structure and species composition increases the risk of losing wildlife and plant species adapted to habitats created or maintained by fire. The invasion of woody shrubs in wetland areas and sloughs due to fire suppression has led to the loss of some habitat, eliminating some colonial wading bird nesting areas and reducing refuge for migrating waterfowl. Vegetation growth has also reduced cultural landscapes and visual landscape aesthetics due to brush encroachment.

This analysis examines the complex scope and effects of ecological restoration and defensible space actions by Seashore fire management staff. To address these ecological and defensible space actions, the Seashore wants to increase the quality and quantity of its vegetation management activities by using manual and mechanical equipment, prescribed burning, wildfire managed for resource objectives, and targeted herbicide use for vegetation manipulation/fuel reduction activities. It is important to understand that there is not one recipe for widespread ecological restoration, hazard fuel reduction, and defensible space action. The characteristics and vegetation of each stand, ecological niche, geographic unit, and relationship with surrounding structures, property ownership, and natural and cultural values must be examined and planned by Seashore staff to determine the appropriate mix of actions to assist in restoration, recovery, and maintenance for each unique area.

In summary the following objectives of this Proposed Action, the new Seashore Fire Management Plan, are:

- To protect human life and safely conduct all wildland fire management activities.
- To utilize activities that protect Seashore private (to include retained rights) property rights, but enhance Seashore natural and cultural values.
- To create/maintain defensible space and fuel breaks, to promote ecological restoration and maintenance, and to reduce hazard fuels.
- To consider more active vegetation management activities including prescribed burning, wildfire managed for resource objectives, mechanical and manual equipment use on vegetation, and targeted herbicide use.
- To provide effective rehabilitation of wildfire areas (rehabilitation of fire suppression impacts and Burned Area Emergency Rehab (BAER)).
- To continue and increase interagency cooperation and coordination, and public outreach about Seashore fire management and restoration activities.
- To update policy and terminology language and discussions.

- To continue active research and monitoring of fire program field actions, by supporting sound resource management and research science, and utilize adaptive management to improve the program.

1.3 Relationship to Other Plans and Policies

The Proposed Action is consistent with the 1984 Draft General Management Plan (GMP; NPS 1984), as well as the Seashore's Resource Management Plan (NPS 1994), Fire Management Plan (FMP; NPS 2004), Statement for Management (1990), and the current Strategic Plan, the Guide to Managing the National Park System, 2006 Management Policies (NPS 2006), and Director's Order 18, Guidance for Wildland Fire, (DO-18).

The proposed fire management activities are consistent with the GMP, which proposes to protect and enhance the natural and recreational values of the Seashore by encouraging environmentally compatible park activities, which allow achievement of the Seashore's purpose. The GMP also proposes to manage the Seashore, to the extent possible, in ways that enhance the natural geological processes of the barrier island system and mitigate human impacts on these processes.

Seashore fire management activities are presently planned, prioritized, and limited by its 2004 FMP.

In accordance with the 2006 NPS Management Policies, the wildland fire management program should be designed to enhance and protect natural and cultural resource objectives; address potential impacts on public and private land adjacent to the park; protect public health and safety; and provide for safety considerations for park visitors, employees, and developed facilities.

The authority for implementing prescribed fire is included in the National Park Service Organic Act of 1916. National Park Service managers are tasked with the mission to do their best to "preserve unimpaired the natural and cultural resources and values of the national park system for the enjoyment, and education of future generations."

DO-18 states that "every NPS unit with burnable vegetation must have an approved FMP." DO-18 defines what an approved FMP must include; emphasizing that firefighter and public safety is the first priority and an interagency approach to managing fires on an ecosystem basis across agency boundaries. DO-18 also directs parks to identify, manage, and where appropriate, reduce hazardous fuels.

1.4 Scoping

Scoping is a process to identify the affected environment that may be impacted by the proposed project, and to identify alternatives for achieving the Proposed Action, while minimizing the potential impacts. NPS conducted both internal scoping with NPS personnel, and external scoping with the general public and interested/affected groups and agencies.

Internal scoping was highlighted by a meeting on August 29, 2012 by an interdisciplinary team of professionals from the Seashore and the Southeastern Regional Office including representatives from fire management, resource management, NEPA specialists, the Superintendent, and the private contractor working on the EA. The interdisciplinary team discussed the purpose and need for the project, discussed potential alternatives to address these needs, did preliminary determination of

potential environmental impacts, and discussed past, present, and foreseeable projects that may have cumulative effects, and potential mitigation measures.

External scoping was begun by distributing a scoping brochure dated October 16, 2012 to various stakeholders describing the project and asking for comments (Appendix A). The brochure was also made available on the PEPC website. In addition, a press release was sent to local and regional media, information was posted on the park website, and brochures were made available at park visitor facilities. Two open house style meetings were conducted to inform the public and various agencies. Discussed were the proposed addition of prescribed burning, the use of manual and mechanical tools, and targeted herbicide application as Seashore fire management tools, and to solicit feedback for direction in this EA. Public meetings were held on November 19th and 20th 2012, in St. Marys and at Cumberland Island, Georgia. During the meeting, NPS representatives were available to present an overview of the proposed actions, discuss issues, and answer questions; attendees were able to submit oral and written comments or write in later, depending on their preference. Two comment cards were generated from the meetings, and four persons provided comments via e-mail and regular mail.

Internal and external scoping comments were considered in the choice of impact topics and were used in the development and evaluation of alternatives discussed in this EA. Scoping issues or impact topics that were considered, but not evaluated further, are discussed in "Impact Topics Dismissed from Further Analysis Section." The public, agencies and American Indian groups traditionally associated with the lands of the Seashore will also have an opportunity to review and comment on this completed EA, and their views will be considered before a final decision is made.

1.5 Impact Topics Retained for Further Analysis

Impact topics for this project have been identified during the internal scoping process, on the basis of federal laws, regulations, and orders, including the NPS 2006 Management Policies, and NPS knowledge of resources at the Seashore. Impact topics that are carried forward for further analysis in this EA are those where the Proposed Action may have a measurable effect. There were 13 impact topics retained for further analysis. The rationale for retaining each of these topics is briefly listed below with a description of the existing setting or baseline conditions (i.e. affected environment) within the project area. Some impact topics were dismissed from further consideration when the environmental effects were estimated to be either minor or negligible. The impact topics along with the desired conditions and relevant laws, regulations, or policies are listed below in Table 1.

Table 1. Impact Topics Retained for Further Analysis and Relevant Laws, Regulations, and Policies.

Impact Topic	General Desired Conditions from NPS Management Documents	Relevant Laws, Regulations, and Policies
Air Quality	Air quality related values should be protected from deterioration, especially on a permanent basis. Perpetuate predominant air quality to sustain human health, scenic vistas, visibility, and visitor enjoyment; and to conserve natural resources and systems and cultural resources.	NPS Organic Act of 1916, as amended; Clean Air Act, as amended; NPS Wildfire Management Reference Manual 18; NPS-77 Natural Resources Management Guidelines; NPS Management Policies; National Environmental Policy Act
Soils	Prevent human activities that cause soil compaction, soil loss or removal, and soil erosion. Prevent soil contamination from human sources. Where previously disturbed, re-establish contours and soil chemistry to support and sustain native vegetation communities.	NPS Management Policies 2006
Vegetation (including Invasive)	Manage vegetation to achieve greatest diversity and health, foster the health and increase state and federal listed species, and allow for reintroduction of native species where absent. Ensure that allowed activities aid in the recovery or maintenance of natural vegetation communities especially special and unique habitats. Ensure processes continue that sustain support of functional physical processes, biological productivity, and biological organisms. Prevent establishment of non-native vegetation, and remove it when possible.	NPS Organic Act; NPS Management Policies 2006; Resource Management Guidelines (NPS-77); Federal Noxious Weed Control Act; Executive Order (EO) 13112; Invasive Species (1999)
Wildlife/Wildlife Habitat	Minimize disturbances to native wildlife habitat. Prevent wildlife exposure to contaminants. Minimize human caused mortality to wildlife. Ensure that allowed activities aid in the recovery or maintenance of wildlife habitat.	NPS-77; Migratory Bird Treaty Act, as amended; EO 13186; Lacey Act, as amended; NPS Management Policies 2006
Special Status Species	Avoid and/or mitigate adverse impacts on state and federally listed threatened, endangered, sensitive, and candidate plant and animal species and their habitats. Manage for the existence or increase of state and federally listed threatened, endangered, sensitive, and candidate plant and animal species and their habitats.	Endangered Species Act, as amended; NPS-77; Migratory Bird Treaty Act, as amended; EO 13186; Lacey Act, as amended; NPS Management Policies 2006; National Environmental Policy Act

Impact Topic	General Desired Conditions from NPS Management Documents	Relevant Laws, Regulations, and Policies
	Ensure that allowed activities aid in the recovery of state and federally listed threatened, endangered, sensitive, and candidate plant and animal species and their habitats.	
Water Resources (including Wetlands)	Avoid diminishing the overall quality and quantity of all surface and ground water resources. Avoid altering drainage characteristics, soil hydrology, and natural movement of ground and surface waters. Minimize destruction, loss, or degradation of wetland and riparian resources from human activities, and preserve related ecosystem, natural, and beneficial values.	Clean Water Act; Fish and Wildlife Coordination Act of 1934 (PL 85-624), as amended; EO 12088; EO 11988 ; NPS Management Policies 2006; NPS-77; Director's Order (DO) 77-2; EO 11990; Director's Order 77-1
Wilderness	Maintain or improve existing quality of wilderness characteristics/resources. Prevent adverse impacts to wilderness characteristics and resources. Administrative activities for wilderness management are minimized, and, if necessary contribute to maintain or improving wilderness quality.	NPS Management Policies 2006; Wilderness Act of 1964; DO-41; Cumberland Island National Seashore wilderness legislation 1982 (PL 97-250) and 2004 (PL 108-447)
Soundscapes	The National Park Service preserves natural ambient soundscapes, restores degraded soundscapes to the natural ambient condition wherever possible, and protects natural soundscapes from long-term degradation due to human-caused noise. Natural sounds predominate outside developed areas—the sounds of civilization are generally confined to developed areas.	NPS Management Policies 2006; DO–47 Sound Preservation and Noise Management
Archeological and Historic Resources	Protects archaeological and historic resources by preventing human caused, and in some cases naturally caused destruction, alteration, or impairment to all or part of the cultural resource. Prevents isolation from or alteration to cultural resources with its surrounding environment. The qualities that contribute to the eligibility for listing or listing of archeological or historic properties on the NRHP are protected in accordance with the Secretary of the Interior's Standards (unless it is determined	National Historic Preservation Act; Executive Order 11593, Protection and Enhancement of the Cultural Environment; Archeological and Historic Preservation Act; the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation; Programmatic Memorandum of Agreement Among the NPS, Advisory Council on Historic Preservation, and the National Council of State Historic Preservation Officers (2008); NPS Management Policies 2006; National Environmental Policy Act

Impact Topic	General Desired Conditions from NPS Management Documents	Relevant Laws, Regulations, and Policies
	through a formal process that disturbance or natural deterioration is unavoidable).	
Cultural Landscapes	The treatment of a cultural landscape will preserve significant physical attributes, biotic systems, and uses when those uses contribute to historical significance. Treatment decisions will be based on a cultural landscape's historical significance over time, existing conditions, and use. Treatment decisions will consider both the natural and built characteristics and features of a landscape, the dynamics inherent in natural processes and continued use, and the concerns of traditionally associated peoples. The treatment implemented will be based on sound preservation practices to enable long-term preservation of a resource's historic features, qualities, and materials. There are three types of treatment for extant cultural landscapes: preservation, rehabilitation, and restoration. Cultural landscapes are listed in the National Register when their significant cultural values have been documented and evaluated within appropriate thematic contexts, and physical investigation determines that they retain integrity. Cultural landscapes are classified in the National Register as sites or districts or may be included as contributing elements of larger districts.	National Historic Preservation Act; Executive Order 11593; Archeological and Historic Preservation Act; the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation; Programmatic Memorandum of Agreement Among the NPS, Advisory Council on Historic Preservation, and the National Council of State Historic Preservation Officers (1995); NPS Management Policies 2006
Visitor Use and Experience	Visitor, resident and employee safety and health are protected and considered in all management actions Visitors understand and appreciate park values, resources, and relationships and have the information necessary to adapt to park environments. Visitors have opportunities to enjoy the parks in ways that leave park resources unimpaired for future generations. Park recreational uses are promoted and regulated, and basic visitor needs are met in keeping with park purposes. All reasonable efforts will be made to make NPS facilities, programs, and services accessible to and usable by all people, including those with disabilities.	NPS Management Policies 2006; National Environmental Policy Act; Americans with Disabilities Act
Park Operations	Park Operations contribute to protecting, restoring, and maintaining natural and cultural resources. The staff develops the knowledge to manage those resources appropriately.	NPS Management Policies 2006

Impact Topic	General Desired Conditions from NPS Management Documents	Relevant Laws, Regulations, and Policies
	Staff maintain, restore, and rehabilitate NPS and visitor facilities and infrastructure, which enhance the visitor experience. Programs are developed that inform and educate visitors, and allow their appreciation and understanding of the unique resources of each park unit. The Seashore fire management program is planned, managed, and implemented to achieve resource management objectives and values. Wildland fires are effectively managed, considering firefighter and public safety, resource values, and private property rights to be protected using the full range of strategic and tactical operations as described in an approved fire management plan.	
Public Health and Safety	All reasonable and necessary measures would be taken to minimize human exposure to fire management related hazards. Besides exposure to fire and smoke, this includes related equipment activities, chemical exposure, exposure to heat and environmental hazards, and work and recreational activities in a remote wilderness setting, etc.	NPS Management Policies 2006; Director's Orders 58; NPS Wildfire Management Reference Manual 18

Natural Resources

1) Air Quality

The Clean Air Act of 1963 (42 U.S.C. 7401 *et seq.*) established federal programs that provide special protection for air resources and air quality related values associated with NPS units. Specifically, Section 118 of the Clean Air Act requires a park unit to meet all federal, state, and local air pollution standards. The Seashore is designated as a Class II air quality area under the Clean Air Act, which means emissions of particulate matter and sulfur dioxide are allowed up to the maximum increase in concentrations of pollutants over baseline concentrations as specified in Section 163 of the Clean Air Act. In addition, the Clean Air Act gives the federal land manager the responsibility to protect air quality related values (i.e., visibility, plants, animals, soils, water quality, cultural resources, and visitor health) from adverse pollution impacts. This was retained as an impact topic since smoke is a byproduct of prescribed burning and would be regulated by the Georgia Environmental Protection Division policies.

2) Soil Resources

The 2006 NPS Management Policies states the NPS will aim to understand and preserve the soil resources and to prevent unnatural erosion, removal, or contamination of them. The action alternatives require hand or mechanical treatments for construction of fuel breaks, herbicide

treatments, managing wildfires for resource objectives, and prescribed burning, which have the potential to have a measurable impact on the soil resources; therefore, impacts to this topic will be analyzed further.

3) Vegetation Resources

The 2006 NPS Management Policies states the NPS will preserve and maintain all plants native to the naturally evolving park unit ecosystems by preserving and restoring the abundances, diversity, dynamics, habitats, distributions, and natural processes of native plants. The Seashore promotes management practices to limit potential impacts to vegetation, to protect sensitive vegetation resources, and to prevent or limit invasive species. The construction of fuel breaks, herbicide treatments, hand and mechanical treatments, managing wildfires, and prescribed burning would remove or change areas of native and invasive vegetation for fuel reduction and/or reintroduce fire into fire-adapted ecosystems. Under the action alternatives, there is a risk of invasive species introduction and spread associated with any ground or vegetation disturbing activity. The Seashore fire program would restore fire-adapted habitat, maintain certain hardwood habitats, and protect or restore other native vegetation habitats; thus, the topic of vegetation was retained for further analysis.

4) Wildlife/Wildlife Habitat

The 2006 NPS Management Policies states the NPS will preserve and maintain animals native to the naturally evolving park unit ecosystems by preserving and restoring the abundances, diversity, dynamics, habitats, distributions, and natural processes of native animals. The Seashore hosts a large selection of wildlife; about 30 mammal species, 50 reptile and amphibian species, more than 300 birds, and about 90 fish species. Feral "non-native" animals include horses, swine, and rats. The action alternatives would alter or disturb wildlife habitat and individual animals, but would be beneficial by restoring native vegetation and wildlife communities; thus, the topic of wildlife was retained for further analysis.

5) Special Status Species

The Endangered Species Act of 1973 requires an assessment for projects on federally managed lands to determine potential effects to all federally listed endangered, threatened, and candidate species. Section 7 of the Endangered Species Act (ESA) requires all federal agencies to consult with the U.S. Fish and Wildlife Service (USFWS) to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of federally listed species or designated critical habitats. In addition, the 2006 NPS Management Policies and Director's Order 77 *Natural Resources Management Guidelines* require the NPS to examine the impacts on federal candidate species, as well as state-listed endangered, threatened, candidate, rare, declining, and sensitive species. The action alternatives could potentially disturb federally listed species or habitat, but may be beneficial in restoring native habitats that are critical in maintaining sensitive species populations. Therefore, the topic of special status species was retained for further analysis.

6) Water Resources

NPS policies require protection of water quality consistent with the Clean Water Act. The purpose of the Clean Water Act is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." To enact this goal, the U.S. Army Corps of Engineers has been charged with evaluating federal actions that result in potential degradation of waters of the United States and issuing permits for actions consistent with the Clean Water Act. The U.S. Environmental Protection Agency also has responsibility for oversight and review of permits and actions, which affect waters of the United States. The Seashore is surrounded by salt water resources with a network of salt marshes, tidal creeks and tidal rivers that open into the St. Andrews or Cumberland Sounds, and have both saline and freshwater inland water bodies. Cumberland Island itself has freshwater bodies of surface and ground water resources. The action alternatives include treatment units that either contain or are adjacent to marshes, freshwater bodies, or saline water bodies; thus the topic of water resources was retained for further analysis.

For regulatory purposes under the Clean Water Act, the term wetlands means "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas."

Executive Order 11990 *Protection of Wetlands* requires federal agencies to avoid, where possible, adversely impacting wetlands. Further, Section 404 of the Clean Water Act authorizes the U.S. Army Corps of Engineers to prohibit or regulate, through a permitting process, discharge of dredged or fill material or excavation within waters of the United States. NPS policies for wetlands as stated in 2006 Management Policies and Director's Order 77-1 *Wetlands Protection*, strive to prevent the loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. In accordance with DO 77-1 *Wetlands Protection*, Proposed Actions that have the potential to adversely impact wetlands must be addressed in a Statement of Findings for wetlands.

NPS manages portions of the island that are above the mean high tide line. Intertidal areas (i.e. salt marshes and beaches) and subtidal areas (i.e. tidal creeks and estuarine waters) are held in public trust by the state of Georgia and are managed by the Coastal Resources Division of the Georgia Department of Natural Resources (CRD). Cumberland Island itself has freshwater bodies of water (small ponds or lakes). Approximately 32% (11,735 acres) of the Seashore has been categorized as wetland (Payne et al. 2003). The action alternatives have the potential to influence wetland resources. Therefore, the topic of wetlands was retained for further analysis.

7) Wilderness

The 2006 Management Policies, Section 6 states, "The National Park Service will evaluate all lands it administers for their suitability for inclusion within the national wilderness preservation system. For those lands that possess wilderness characteristics, no action that would diminish their wilderness suitability will be taken until after Congress and the President have taken final action. The superintendent of each park containing wilderness will develop and maintain a wilderness management plan to guide the preservation, management, and use of the park's wilderness area, and ensure that wilderness is unimpaired for future use and enjoyment as wilderness." There are lands designated as wilderness or potential wilderness in the action alternatives. Thus, wilderness was retained for further analysis.

8) Soundscape Management

In accordance with the 2006 Management Policies for the NPS and Director's Order 47 *Sound Preservation and Noise Management*, an important component of the NPS's mission is the preservation of natural soundscapes associated with national park units (NPS 2006). Natural soundscapes exist in the absence of human-caused sound. The natural ambient soundscape is the combination of all the natural sounds that occur in park units, together with the physical capacity for transmitting natural sounds. The frequencies, magnitudes, and durations of human-caused sound considered acceptable varies among NPS units, being generally greater in developed areas and less in undeveloped areas.

Fire management impacts to the soundscape could occur from mechanical equipment (e.g., chainsaw, bush hog, masticator) used for reduction of hazardous fuels and to create fuel breaks; also from noise associated with prescribed fire or fire managed for resource objectives. These impacts should be minor and temporary and may exceed the natural ambient soundscape present during these operations. The Seashore values and strives to preserve the natural soundscape associated with the physical and biological resources of the park. Thus, soundscapes was retained for further analysis.

Cultural Resources

9) Archaeological and Historic Resources

Section 106 of the National Historic Preservation Act (NHPA), as amended in 1992 (16 USC 470 *et. seq.*); the NPS's Director's Order 28 *Cultural Resource Management Guideline*; and NPS 2006 Management Policies require the consideration of impacts on historic properties that are listed, or eligible to be listed, in the National Register of Historic Places (NRHP). The term "historic properties" is defined as any site, district, building, structure, or object eligible or listed in the NRHP, which is the nation's inventory of historic places and the national repository of documentation on property types and their significance. The above-mentioned policies and regulations require federal agencies to coordinate consultation with the State Historic Preservation Officer regarding the potential effects to properties listed on or eligible for the National Register of Historic Places.

The NPS, as steward of many of America's most important cultural resources, is charged to preserve historic properties for the enjoyment of present and future generations. Management decisions and activities throughout the National Park System must reflect awareness of the irreplaceable nature of these resources. The NPS will protect and manage cultural resources in its custody through effective research, planning, and stewardship in accordance with the policies and principles contained in the NPS 2006 Management Policies, federal laws, and the appropriate Director's Orders.

The term "historic structures" refers to both historic and prehistoric (archeological) structures, which are defined as constructions that shelter any form of human habitation or activity. Historic structures on the Island date from the Greene, Stafford, High Point, and Carnegie periods, with three large mansions and the ruins of a fourth remaining as well as 80 other structures of various size, type, and condition. The Seashore has five historic districts—Dungeness, Stafford Plantation, Plum Orchard, High Point-Half Moon Bluff, and the Greyfield (private land)—of which all are listed on the NRHP. Also listed on the NRHP are Main Road and Rayfield and Table Point Archeological Districts. Fire management impacts to historic resources would be negligible; however, historic resources are

important in preserving cultural heritage in the Seashore. Prescribed burns, wildfires, and mechanical and manual hazard fuel reductions could potentially disturb archeological resources. Therefore, archeological and historic resources will be further analyzed.

10) Cultural Landscapes

"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 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 (DO-28)." (NPS's Director's Order 28 *Cultural Resource Management Guideline*). These inventories are a computerized, evaluated inventory of all Cultural Landscapes in which NPS has or plans to acquire any legal interest. Cultural Landscapes must be documented then evaluated for significance and integrity and then may be nominated for listing on the National Register.

Prescribed fire would be used to help maintain open fields of identified cultural landscapes and associated cultural landscapes of the historic districts. In many cases, these landscapes have been significantly altered by later human activities and obscuring vegetation growth. There are four NRHP historic cultural districts (Dungeness, High Point-High Moon Bluff, Plum Orchard, and Stafford Plantation) with cultural landscapes that reflect the utilization by the Native American culture, plantation era, African-American communities, and the resort/estate era. Under the action alternatives, the Seashore Fire Management Plan would be utilized to identify and protect natural and cultural features, as well as facilities. The action alternatives should cause no adverse impacts to Cultural Landscapes; however, cultural landscapes are important in preserving cultural heritage in the Seashore. Therefore, the cultural landscape topic was retained for further analysis**.**

Social Resources

11) Visitor Use and Experience

NPS 2006 Management Polices states the fundamental purpose of all parks is for the enjoyment of park resources and values by the people of the United States. NPS is committed to providing appropriate, high-quality opportunities for visitors to enjoy the parks, and will provide opportunities specifically suited for the natural and cultural resources found within each park area.

The Seashore enabling legislation allows for the typical range of opportunities found in natural areas, but also allows for limited hunting activities, which is unusual in many NPS units. Some temporary disruption to visitor activities may occur during some "on the ground" fire management activities or from wildfires. These effects are expected to be minor and short-term, and in some cases beneficial, with a temporary effect to the overall visitor experience. However, this topic was retained for further analysis due to the fundamental NPS goal of providing for visitor enjoyment.

12) Park Operations

Park operations include changes that may affect the current facilities or that may require a new level of maintenance or staffing. The action alternatives would require an increase in fire management staff manpower to implement the proposed fire management tools (i.e., prescribed fires, to manage

wildfires for resource objectives, mechanical and manual vegetation treatments, and targeted chemical treatments); thus, park operations were retained for further analysis.

13) Human Health and Safety

NPS 2006 Management Polices states park managers should strive to protect human life, by providing injury free visits and a safe and healthful environment for visitors and employees. Under the Proposed Action, manual and mechanical fuels reduction treatments, wildfire management for resource objectives, targeted herbicide use, and prescribed burning would be beneficial by reducing hazardous brush areas, making wildfire control more successful. Managed properly, the use of prescribed fire, managed wildfire, mechanical and manual treatments, and herbicide treatments produce manageable and minor risk to employees and visitors. The reduced fuels would improve the safety for visitors, adjacent private landowners, NPS infrastructure, and NPS cultural and natural resources from intense wildfires. Wildland fires pose a significant risk to the health and safety of firefighters, NPS employees, and the public. Because activities addressed under the action alternatives have the potential to impact human health and safety in the vicinity of the fire management projects human health and safety was retained for further analysis.

1.6 Impact Topics Considered, but Dismissed from Further Analysis

1) Floodplains

Executive Order 11988 *Floodplain Management* requires all federal agencies to avoid construction within the 100-year floodplain unless no other practicable alternative exists. The NPS guided by the 2006 Management Policies and Director's Order 77-2 *Floodplain Management* will strive to preserve floodplain values and minimize hazardous floodplain conditions. According to Director's Order 77-2 *Floodplain Management*, certain construction within a 100-year floodplain requires preparation of a Statement of Findings for floodplains.

Historically, fire was a natural process that occurred and helped shape the native vegetation (Van Lear and Waldrop 1989, Frost 1998). The Proposed Action would not involve the filling or alterations of floodplain areas, and would not require the construction of structures or firelines within floodplains. Many of the topics and considerations for floodplains are included in the considerations for Wetlands, a retained impact topic. Limited prescribed fire and targeted herbicide treatments would not affect floodplain values; the topic of floodplains was dismissed from further analysis.

2) Ethnographic Resources

Director's Order 28 (DO-28), *Cultural Resource Management*, defines ethnographic resources as any site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of an associated traditional group. According to DO-28 and Executive Order 13007, *Indian Sacred Sites*, the NPS should preserve and protect ethnographic resources. The Proposed Action would be designed to minimize any impacts to known cultural resources and to restore native plant communities that could be identified as ethnographic resources. The Seashore consults with tribes and associations and plans to continue such collaboration efforts. The Seashore has the goal of avoiding and minimizing impacts to ethnographic resources; if tribes identify ethnographic resources that need to be protected or enhanced (prescribed burning), the Seashore will try to enhance the condition of those resources. If

prescribed burn or fuel treatment activities are proposed that would significantly alter the physical characteristics of a site, tribes that are culturally affiliated to the Seashore will be notified and given at least 30-day notice to comment. The Proposed Action would have negligible effects on ethnographic resources; therefore, ethnographic resources were dismissed from further analysis.

3) Paleontological Resources

The 2006 Management Policies for the NPS states the paleontological resources (fossils), including both organic and mineralized remains in body or trace form, will be protected, preserved, and managed for public education, interpretation, and scientific research. There are no known paleontological resources with integrity within the Seashore. Therefore, there would be no impacts to paleontological resources as a result of the Proposed Action and the topic was dismissed from further assessment.

4) Museum Collections

The Director's Order 24 *Museum Collections* states that NPS is required to consider the impacts on museum collections (historic artifacts, natural specimens, and archival and manuscript material), and provides further policy guidance, standards, and requirements for preserving, protecting, documenting, and providing access to, and use of, NPS museum collections. No museum collection items would be disturbed as a result of the Proposed Action. Therefore, museum collections were dismissed from further analysis.

5) Lightscape Management

The 2006 Management Policies for the NPS states the NPS will strive to preserve natural ambient landscapes, which are natural resources and values that exist in the absence of human caused light (NPS 2006). NPS strives to limit the use of artificial outdoor lighting to the amount necessary for basic safety requirements. There should be no impacts to lightscape management; thus, this topic was dismissed from further analysis.

6) Prime and Unique Farmlands

The Farmland Protection Policy Act of 1981, as amended, requires federal agencies to consider adverse effects to prime and unique farmlands that would result in the conversion of these lands to non-agricultural uses. Prime or unique farmland is classified by the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS). Prime farmland is defined as land that has the best combination of physical and chemical properties for producing food, forage, fiber, and oil seed, and for other uses (e.g., pasture land, forest land, and crop land). Unique farmland is defined as land other than prime farmland that can produce high value and fiber crops, such as fruits, vegetables, and nuts. There are no prime and unique farmlands designated in the Seashore; thus, this topic was dismissed from further analysis.

7) Indian Trust Resources

Secretarial Order 3175 mandates any anticipated impacts to Indian trust resources from proposed project or action by the Department of Interior agencies be explicitly addressed in environmental documents. 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, and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes. The Seashore is a public holding and is not considered Native American trust resources and do not have any designated Native American trust resources. Therefore, Indian Trust Resources was dismissed as an impact topic for further analysis.

8) Environmental Justice

Executive Order 12898 *General Actions to Address Environmental Justice in Minority Populations and Low-income Populations* requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minorities and low-income populations and communities. The Proposed Action would not be expected to have disproportionate health or environmental effects on minorities or low-income populations or communities as defined by the US EPA Environmental Justice Guidance (US EPA 1998). Therefore, environmental justice was dismissed from further analysis.

2.0 ALTERNATIVES CONSIDERED

2.1 Alternative 1: No Action Alternative—Continue Current Fire Management Activities

This alternative represents what would occur if the Seashore fire management program is limited to fire management activities under the 2004 to present (updated annually) Fire Management Plan (FMP). The current FMP is partially based on the Hazardous Fuels Reduction Categorical Exclusion (2003). The NPS has decided that it will no longer use this Categorical Exclusion as of April 2015 (4/24/2012 NPS Memo on Use of Hazardous Fuels Categorical Exclusion). This is one reason that the Seashore initiated this EA process. Until April 2015, the Seashore may continue to implement mechanical and manual vegetation reduction activities in Seashore Wildland Urban Interface (WUI) or other areas approved under the 2004 FMP. WUI is where human development meets or intermingles with undeveloped wildland or vegetation fuels. After April 2015, this alternative would limit Seashore fire management activities to full wildfire suppression and management options allowed under National Fire Policy. This alternative provides a baseline for comparing and evaluating the impacts to the environment by the action alternatives, upon expiration of the Categorical Exclusion. The approved fire program at the Seashore would continue, but fuels management activities would be only minor and emergency actions unless separate, project specific NEPA processes occurred.

The absence of mechanical and manual fuel reduction work, prescribed fire, wildfire managed for resource objectives, and the inability to utilize herbicides to limit brush return after fuel reduction work would greatly reduce ecological restoration and defensible space actions that are necessary to fulfill direction in the Seashore's enabling legislation and NPS management policies (2006 NPS Management Policies, Reference Manual-18). Maintenance of unique ecosystems would not occur by introduced fire or other fuels management techniques. This would result in continued retention and buildup of hazardous vegetative fuels. Fire would not be used in fire dependent ecosystems except in uncontrolled wildfire incidents, where it may often be high severity events and more difficult to control. The buildup of fuels could pose high fire risk to visitors, firefighters, private property structures, NPS infrastructure, and cultural and natural resources. There would be reduced

resilience of Seashore fire-adapted ecosystems to continued stress from hurricanes, drought and climate change, pest outbreaks, and wildfire.

Major activities of this program that would continue under this alternative include:

- Wildfire suppression utilizing the appropriate response, (includes both direct and indirect attack, the use of foam and retardant, and helicopter water bucket dropping activities, using river or brackish water);
- Minimum Impact Suppression Techniques (MIST) on all wilderness fires
- Utilization of wildland fire Resource Advisors;
- Post-fire activities would consider emergency stabilization and BAER;
- Monitoring of field activities and ecosystem components would occur by the NPS and its partners; and
- Interagency coordination, cooperation and related program activities would continue.

2.2 Alternative 2: Action Alternative—Utilize prescribed burning, limited mechanical and herbicide use, and wildfire utilizing resource objectives as treatment tools

Under this alternative, the Seashore fire management program would utilize certain fire management methodologies or "tools," where and when appropriate. These tools will focus on proactive fire management activities that would protect and preserve Seashore values. This alternative would allow prescribed burning in most Seashore areas. Also included would be wildfire after natural lightning ignitions, managed using selected strategies and identified incident objectives, which may include resource objectives in the Natural Zone fire management unit (FMU; Figure 2). It would also allow the utilization of mechanical and manual fuel reduction activities in specific areas, and limited herbicide use as a follow-up treatment to some of the mechanical fuel break treatments and/or defensible space work. Mechanical equipment would be used to create/maintain defensible space around NPS and private structures and fuel breaks using existing road and trail systems. All would be utilized under carefully prescribed conditions, plans, and objectives to restore and protect Seashore values to the maximum extent possible, considering and balancing all risk factors. Seashore values include Seashore ecosystems and natural values (including wilderness), cultural resources, risk to firefighters, recreational resources, private property, and NPS infrastructure. Management mitigation measures would be listed to prescribe how and when to use each of these measures. Adaptive management would allow updating these techniques or using improved methods as they are developed and evolve over the years, as long as they are within the scope of this analysis.

The major fire management program activities discussed above in the "No Action Alternative" would also occur under this alternative.

Some limited mechanical actions and herbicide use would occur in the Seashore Wilderness. Mechanical equipment such as masticators (brush cutters), chainsaws, and similar hand-held equipment would be used along selected abandoned roads, (most are now considered trails, but some still have private vehicle use easements that pre-date wilderness designation). Trails that could have limited mechanical actions and herbicide treatments include Bunkley Trail, Roller Coaster Trail, Oyster Pond Trail, Tar Kiln Trail, and Table Point Road, power line cut, and Willow Pond Trail. Reducing the vegetation and hazardous fuels along these wilderness roads/trails allows them to be effectively and safely utilized as holding lines for firefighters during prescribed burns or wildfires. Successfully completing more prescribed burns and/or wildfires managed for resources objectives

would diversify the vegetation age class and species mix in the park, providing more habitat variety and resilience. These fuel breaks would help with confinement of wildland fires for resource objectives while restoration is occurring and thus promoting the re-establishment of fire to the former fire adapted ecosystems. After hazardous fuels are reduced, and ecosystem restoration by fire is underway, expectations are that mechanical work in the wilderness could cease. Herbicide use would only be using EPA approved herbicides under their specified conditions, and then undergo the rigorous NPS evaluation and risk process through the regional and national offices (the NPS herbicide evaluation and approval process is described in section 2.2.1).

The NPS anticipates that this Proposed Action with mitigation measures will best satisfy all current NPS requirements to carry out management practices ensuring effective, efficient resource protection and management, and to insure the safety of park employees, firefighters, adjacent landowners, and visitors.

Under Alternative 2, the expected acreage that could be treated using prescribed fire would vary in size from 10 to 1,500 acres treated annually. The acreage for wildfires managed for resource objectives will be highly variable, depending on ignition location, time of year, presence or absence of drought, availability of resources, weather and fire behavior, and a host of other factors. For mechanical treatments, 10 to 200 acres might be treated annually (0–10 of these acres in the Wilderness). The expected Seashore acreage that could be treated with herbicide as a follow-up treatment to mechanical treatments is 0–20 acres per year (0–5 of these acres in the Wilderness). There is no way to predict the acreage that could be treated annually by managing wildfire for resource objectives, as it depends on the randomness of lightning ignitions, weather, vegetative fuel conditions, firefighting resource availability, and other factors.

2.2.1 Scope and Details related to Herbicide Treatments

The Seashore is committed to its role as natural resource stewards, and dedicated to protecting the land, waters, wildlife, and people who live nearby, work there and visit. While utilizing NPS and EPA approval processes, the Seashore will use the best available science to examine proposed herbicide uses for risk versus benefit.

This alternative includes the use of limited herbicide spraying as a management tool, but allows the flexibility to consider and use improved techniques, technology, and newly approved herbicides in the future if more environmentally acceptable alternatives are developed. The use of targeted herbicide application, such as hand application of herbicide to specific basal or foliar plant areas, would minimize chances for overspray. Use of targeted herbicide applications as a follow-up treatment to maintain fuel breaks and/or defensible space work established by mechanical or manual vegetation cutting treatments would improve the longevity of the fuel reduction, and facilitate maintenance of these treatment areas. Being able to more successfully create and maintain fuel breaks and/or defensible space removes a significant fuel hazard in prescribed burns, or for wildfires. This would make prescribed burning safer for employees and nearby residents plus aids in the control of wildfires and improve egress in the event of evacuation. This would also help to return vegetation communities to the range of natural variation where prescribed burning or wildfires managed for resource objectives could be utilized as the primary natural change and maintenance agents. Maintaining fuel breaks using herbicide application as a follow-up treatment would help to create reduced brush areas, making prescribed fire and wildfire control more effective and successful next to Seashore residents, structures, and facilities. This would provide better protection than the

"No Action Alternative" for visitors, residents, NPS infrastructure, NPS cultural and natural resources, and facilities.

Herbicide application in NPS areas may only be utilized by following NPS Management Policy 4.4.5 and 4.4.5.2, and Director's Order 77-7, which outlines the NPS approval process. To get approval, the Seashore's IPM Coordinator submits a pesticide use proposal into the NPS Pesticide Use Proposal System. Approval comes only after regional and national level staff consider numerous factors including: the target use, location where the application will occur, potential T&E species concerns, potential for getting into surface or ground water, persistence in the ecosystem, safety to employees and the public, type of application (example, spot spraying), etc. A product may be approved or not depending on the above factors and alternative treatment possibilities. An herbicide application map and treatment plan will be developed for each treatment area.

Approved herbicides must have undergone EPA environmental and toxicological testing, and then must be EPA approved and labeled, (as required under the Federal Insecticide, Fungicide and Rodenticide Act of 1972—the process to determine whether or not the product is safe for human health and environmental purposes). Application methods and rates must be followed by the NPS as identified on the product label. The Seashore staff must utilize the NPS designated recordkeeping system for purchasing, storing, tracking and maintaining each approved product. Seashore approved applicators would be trained in spill response procedure, which would include actions to prevent leaks, spills, and accidental exposures.

Treatment methods would include foliar spray applications using a boom sprayer and/or low-volume spot treatments of individual plants with a backpack sprayer or a sprayer mounted on an all-terrain vehicle. All treatments would be done with NPS approved herbicides and as specified on the label and precautions would be taken to avoid areas of standing waters. Foliar treatment involves spraying herbicide directly onto leaves of trees and/or vegetation. The herbicide should be applied at a volume that wets the crown/leaves, but minimizes runoff and does not affect non-target species.

The Southeast Region of the NPS has a small professional monitoring staff that measures and monitors vegetation manipulation activities and effects (i.e., prescribed fire, mechanical, herbicide, control areas). Systematic monitoring may occur before and after an area has been treated to determine vegetation mortality and progress toward meeting treatment objectives. Additional targeted herbicide treatments might occur after vegetation re-growth to suppress re-sprouts within the fuel break and/or defensible space.

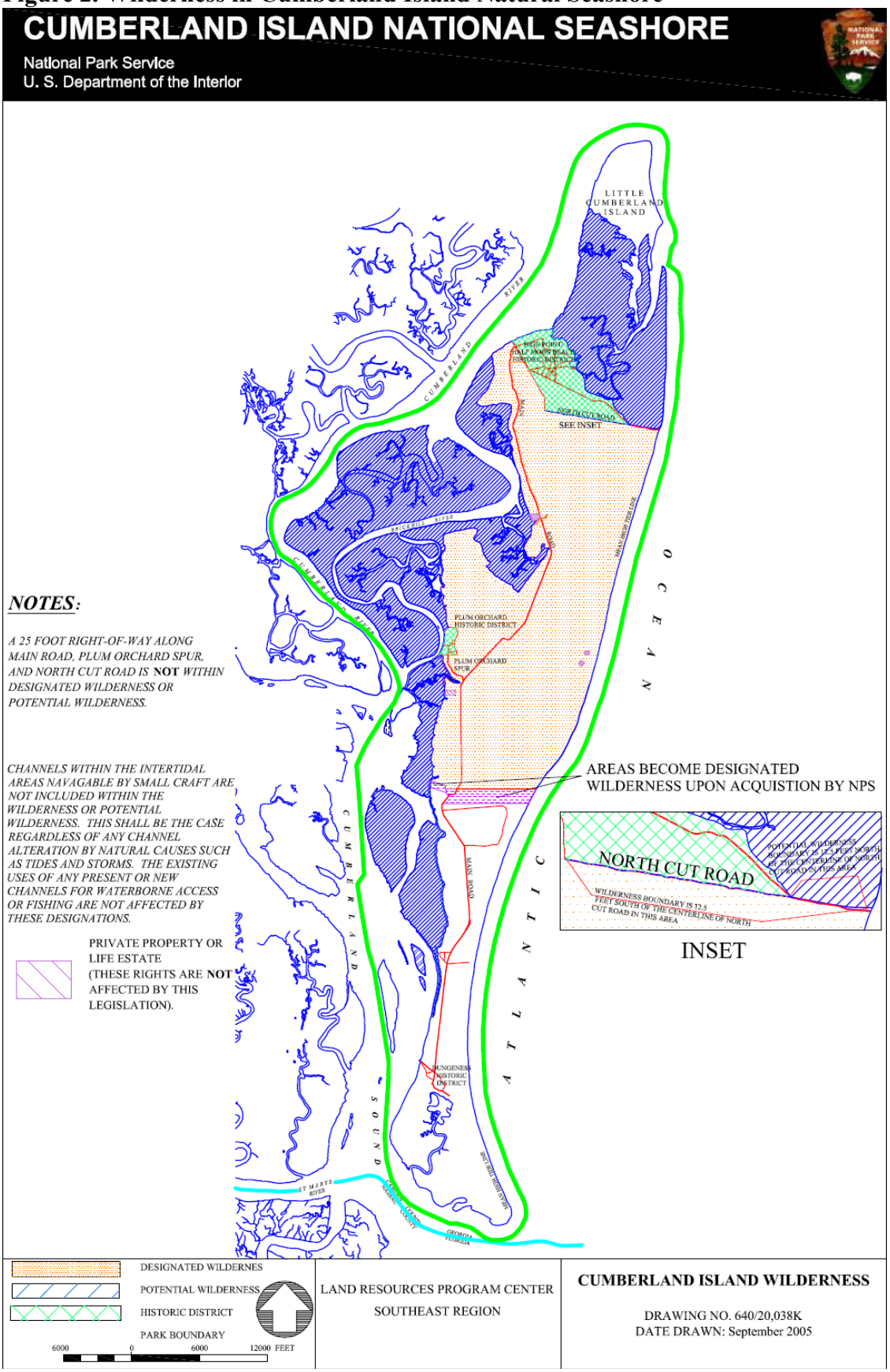
2.3 Alternative 3: Action Alternative—Utilize all above tools in Alternative 2, except that mechanical would not be utilized in the Seashore Wilderness.

This Alternative is similar to Alternative 2, except that mechanical treatments would not be used in the Seashore Wilderness (Figure 2). Vegetation has built up to hazardous fuel levels in the Seashore Wilderness after recovery from over a century of manipulation by humans—logging, farming, grazing, and fire suppression. Fuels adjacent to selected existing (abandoned) roads and trails would not be reduced with mechanical equipment. The wilderness trails listed under section 2.2 would not receive any mechanical treatment under this Alternative. Due to lack of safe and effective areas in the Wilderness to stop wildfire on the ground, ground suppression activities will often be limited in the Wilderness to minimize unacceptable risk to firefighters. Thus, suppression actions would usually be outside the Wilderness boundary, where more roads and future fuel breaks are located.

Manual hand-held equipment such as cross cutters, pruners, and axes, would be used along existing roads and trails including those listed under section 2.2. However, without doing some mechanical vegetation management work along Wilderness roads/trails, the task to improving fuel breaks in the Wilderness become difficult and impractical. The sheer volume of work required for small hand crews, the risk to crew safety due to numerous wilderness and environmental hazards (heat, snakes, evacuation procedures, etc.), all make significant project-level progress by manual hand-held equipment unlikely. Thus, the Wilderness could not be effectively broken into smaller "burn" blocks for prescribed burns, and wildfires would be less likely to be stopped at a smaller size. Prescribed fire would be more difficult to utilize effectively in the Wilderness, so hazard fuel reduction by burning would be more limited. If prescribed burns were to occur, they may have to be larger in size utilizing roads outside the Wilderness and natural barriers.

Mechanical work and thinning around and outside the boundary of the wilderness may have to be more substantial in order to create effective fuel breaks that have an increased probability of containing larger wildfires that could escape the wilderness.

Figure 2. Wilderness in Cumberland Island Natural Seashore



2.4 Fire Management Actions and Components Comparison Table

Table 2 is included to clarify actions, components, and some expectations that might result from each alternative.

Table 2. Comparison of Alternatives and Fire Management Activities and Components

Fire Management Activities and Components	***Alternative. 1 No Action Alternative after April 2015***	***Alternative 2 Maximize Fire Mgmt. Tools***	***Alternative 3 No Mechanical in Wilderness***
Suppression actions would occur utilizing the appropriate response per National Fire Management policy	X	X	X
-direct and indirect attack would be utilized, depending on conditions	X	X	X
-aerial retardant and aerial foam could be utilized with Superintendent's approval	X	X	X
-helicopter bucket drops could be used on fires using brackish river water	X	X	X
-mechanical equipment could be used to suppress wildfires with Superintendent's approval	X	X	X
-wilderness values would be an objective considered in wilderness suppression actions, (example: utilize Wilderness Minimum Tool Analysis, MIST tactics)	X	X	X
-minimum requirements analysis (MRA) would be utilized before non-emergency actions in wilderness	X	X	X
-Resource Advisors would be involved in wildfires	X	X	X
-Burned Area Emergency Actions (BAER) and emergency stabilization could occur after wildfires	X	X	X
-Interagency and community cooperation and coordination would occur	X	X	X
Prescribed Burning utilized with approved burn plans in all FMU's		X	X
Mechanical methods (such as masticators) utilized for fuel breaks and defensible space work in non-		X	X

Fire Management Activities and Components	***Alternative. 1 No Action Alternative after April 2015***	***Alternative 2 Maximize Fire Mgmt. Tools***	***Alternative 3 No Mechanical in Wilderness***
wilderness areas of the Seashore			
-Limited mechanical equipment (such as masticators along abandoned roads) would be utilized in Wilderness to create fuel breaks to limit size/growth of prescribed fire and wildfires during ecological restoration		X	
Expected larger wildfires, due to lack of practical fuel breaks or natural boundaries in wilderness, and buildup of hazardous fuels. Estimate more stand replacing fires.	X		X
Some manual (hand) methods utilized for fuel breaks and defensible space work in all areas of the Seashore		X	X
Spot herbicide application may be utilized to follow up on vegetation reduction techniques to slow brush regrowth response in all areas of the Seashore		X	X
Wildfire natural ignitions could be utilized under appropriate conditions to meet resource objectives, only in Natural Zone FMU.		X	X
Pro-active vegetation manipulation actions would occur to protect private property regardless of FMU		X	X
Effective pro-active ecological restoration actions could occur to protect or maintain unique Seashore habitats and values		X	X
FMU's would be developed to help manage Seashore areas, based on management actions that are approved from this EA.	X	X	X

2.5 Alternatives Considered and Rejected

One additional alternative was considered during scoping, but dismissed:

Dismissed **Alternative 4** would authorize the use of wildfire for resource objectives in all areas of the Seashore. This means that natural (lightning) ignitions would be managed (allowed to burn) under appropriate conditions for resource objectives, even in Seashore developed areas. Resource objectives include resource related goals such as special habitat renewal, reduction of hazardous fuels, wildlife values, reintroducing fire into fire dependent ecosystems, etc.

This alternative was dismissed because managing natural ignitions in the immediate area of some Seashore values creates unacceptable risk to: visitors, residents, and firefighters; damage or destroy NPS infrastructure, NPS cultural and natural resources, and adjacent private lands and structures. Due to the unpredictable location and nature of wildfire ignitions, it is important to immediately initiate reasonable and appropriate suppression activities without delay when important values are located nearby. There might be limited time or resources to manage natural ignition fire, and time is of the essence. Management uncertainty or delay while determining what to do can lead to damage or destruction of Seashore values. Mechanical, manual, herbicide, and prescribed fire are better tools to use in these developed areas for habitat maintenance and fuel reduction. Hazardous fuels are already built up in and adjacent to Seashore values and developed areas, making this type of management too risky at this point in time at the Seashore.

2.6 Mitigation Measures during the Proposed Action

The Seashore Fire Management staff would work with the Resource Management staff to ensure that natural and cultural resource management issues and concerns are considered on all planned projects at the Seashore.

The Superintendent has overall responsibility and oversight for all Seashore activities and staff; he/she sets goals, approves Seashore restrictions and closures, coordinates relations with neighbors and partner agencies, and approves the FMP and other major fire documents and plans.

The Fire Management Officer and Incident Commanders assigned by the Superintendent have direct responsibility for public, resident, and staff safety. They would coordinate evacuations and other actions with the appropriate park ranger staff, Seashore supervisors, and local emergency management agencies.

Resource Advisors (READ's) should be assigned to wildfires of significance to prevent and reduce adverse impacts from fire suppression actions. Assigning READ's (or Resource Management staff) may also be considered for prescribed fire and vegetation management activities.

For all fire management non-emergency human activities proposed in Wilderness, a minimum requirements analysis (MRA) is a "minimum tool" consideration that would be utilized in advance of the activity to help determine the appropriate action, its Wilderness impacts, and any specific mitigation measures.

The following mitigation measures would help minimize potential effects of Seashore fire management activities on resources, staff, and the public. They would be incorporated into the new

FMP and fire management work at the Seashore, as appropriate, if the Preferred Alternative is adopted.

General Considerations

- All prescribed burns would have a written and approved prescribed fire burn plan, as required by NPS *Reference Manual-18* and the *Interagency Prescribed Fire Planning and Implementation Procedures Guide.*
- Firefighters would utilize Minimum Impact Suppression Tactics (MIST) to minimize impacts of fire response operations whenever possible.
- Constructed firelines would be built to the minimum depth and width needed for safe control operations.
- Constructed firelines would be rehabilitated as soon as possible after fires are out to prevent erosion and negative visual effects.
- Natural, manmade features or vegetation change barriers would be utilized whenever possible to minimize the need for fireline construction, thus minimizing disturbance (e.g., soils, habitat, vegetation) by mechanical or hand line construction. Indirect/confine type strategies would be the preferred strategy for most wildfires.
- Reasonable procedures would be developed to prevent unintended spills of foam and fire retardant chemicals.
- Existing roads would be utilized by vehicles and equipment for travel as much as possible. Utilize ATV's or balloon tired vehicles, if possible, when off road travel is required.
- Existing roads would be utilized by vehicles and equipment as much as possible. Less sensitive travel routes would be utilized for firefighters, vehicles, and equipment whenever possible.
- After major wildfires, BAER would be considered in consultation with regional office and resource specialists.
- Equipment operators would be trained to minimize soil and vegetation disturbance, compaction, and displacement, which can allow establishment of invasive plants. Untrained or new operators would be accompanied by READ's whenever possible to recommend low-impact operations and techniques.
- Equipment with fluid leaks would not be utilized. Refueling or filling or mixing of gas and other fluids would be avoided in the field when possible; when necessary, appropriate precautions would be taken to prevent spills. These actions would be taken away from streams and watercourses.
- Herbicide would only be utilized after undergoing the NPS national and regional approval process and considering impacts to natural resources and public health and safety. Herbicide would not be used during 8 mph or greater eye level wind. EPA instructions would be the primary direction that would be followed when applying herbicide.
- An herbicide application map and treatment plan would be developed for each treatment area.
- Herbicide would not be applied within 3 hours of predicted precipitation or in areas of standing or flowing water.

- Herbicide and application devices would be worked on, filled and mixed only utilizing approved leak prevention, and catchment systems. These sites should be away from streams or standing water.
- No visible leakage of chemicals would be allowed from equipment used for transporting, storing, mixing, or applying chemicals.
- Staff utilizing herbicide would be trained in approved procedures related to proper handling, storage, transportation, mixing, spill prevention, and application procedures.
- Prescribed fire would not occur sooner than 2 weeks after herbicide has been applied. Longer delays may be planned to allow target vegetation time to dry and burn better during prescribed burning. This delay time would also allow the herbicide to be absorbed into the target plant tissue and naturally decompose before burning.

Air Quality

- Fire/park staff would perform agency, public, and neighbor notification procedures for all Seashore prescribed burns, focusing on residents and activities that might be impacted by smoke from the burns.
- Coordination with adjacent agencies and landowners would occur regarding the total number of prescribed fires in the area or fires with resource objectives, simultaneously occurring in the area, to limit cumulative smoke impacts.
- The Seashore would follow the burning regulations issued by the Georgia Environmental Protection Division, Air Protection Branch and the Georgia Forestry Commission.
- Prescribed burns would be postponed when Georgia or County air regulatory agencies declare air pollution episodes where smoke from fires could worsen bad air quality.
- Coordination with the Superintendent would occur in advance of prescribed fires to fully consider the effects of prescribed fire smoke during holidays or periods of heavy public visitation and/or hunting activities.
- When possible prescribed burns would be conducted when fuel moistures are relatively low to provide better combustion, more transport and lofting of the smoke column, and less residual burning.
- Smoke transport winds would be assessed by prescribed fire managers to determine smoke impacts to sensitive receptors, military facilities, boat traffic, and populated areas.
- Timing and methods of ignition on prescribed burns would be constantly assessed and reviewed by fire managers to minimize smoke impacts.
- The Prescribed Fire Burn Boss would be trained in smoke reduction techniques.
- During Seashore prescribed burns, smoke monitoring would occur throughout ignition and immediately after; data would be saved as part of the prescribed fire project records.
- On significant wildfires, and fires with resource objectives, Seashore incident commanders would work with public information officers to regularly update local residents on expected smoke impacts.

Soils

- Vegetation would be removed, cut or manipulated along firelines to the minimum width necessary for fire control or to protect human, natural or cultural values.
- Water diversion devices or brush covering (after fire is out) would be considered on all sloping and bare soil firelines to prevent erosion.

- Firefighters would utilize MIST to minimize soil related impacts of fire response operations whenever possible.
- Utilize water, pumps, and hose lines when available for wetlines or to back-up smaller firelines to minimize the amount of fireline construction and soil disturbance.
- Prescribed fire prescriptions would be utilized that minimize widespread intense and long duration surface burning on soil surfaces to prevent soil sterilization.
- Equipment operators would be trained to minimize soil and vegetation disturbance, compaction, and displacement.
- Dozer and/or dozer plow may be used in extreme circumstances such as when conditions indicate the need despite the environmental effects or when lives are at risk. Use of dozers would be considered only upon consultation of Resource Management staff and specific permission of Superintendent.
- Equipment operation would be avoided on steep slopes, fragile or highly erosive soils.
- Low impact equipment and techniques, such as rubber tracked or tired machinery and masticating machinery that cuts above the ground level, could be used to minimize soil disturbance.
- When possible, mowing or mastication would be considered for firelines to avoid exposing mineral soils.
- Mop-up on fires would be done utilizing methods to minimize soil disturbance. Only herbicides that do not maintain a long-term active residue in soils would be utilized.

Vegetation, (including invasive plant species)

- Vegetation would be removed, cut or manipulated along firelines to the minimum width necessary for fire control or to protect human, natural or cultural values. Avoid extensive falling and bucking of trees.
- Water, pumps, and hose lines, when available, would be utilized to create wetlines or to back-up smaller firelines to minimize the amount of fireline construction and vegetation disturbance.
- Stream or water crossings should be avoided when possible by firelines or equipment to minimize riparian vegetation disturbance. When necessary they should be carefully constructed to minimize disturbance to the watercourse. Crossings should promptly be restored and rehabilitated in consultation with resource specialists.
- Managing wildfires where resource objectives are a primary goal would generally be avoided during intense drought or extreme fire risk periods.
- Appropriate weather, fuel, fire behavior, fire management, staffing and social considerations will be listed for managing wildfires where resource objectives could be a primary objective. These considerations and conditions will be outlined in the FMP.
- Mastication would generally be avoided, or use modified, if fireline is in a unique habitat area where cutting of some vegetation may be undesirable. Treatment/vegetation cutting plan may be more closely analyzed and modified in consultation with Resource Management to meet additional requirements.
- When possible, mowing or mastication would be utilized for firelines to avoid exposing mineral soils. When scraping is needed, it would be to the minimum depth and extent necessary for safe fire control operations. Minimizing soil exposure provides fewer opportunities for establishment of new invasive plant species.

- Slash disposal areas would be identified that have no sensitive natural or cultural resources, or sensitive vegetation habitats.
- Prescribed burning prescriptions would be developed that meet specific vegetation management objectives for each prescribed burn unit. These prescriptions would consider variables such as live and dead fuel loading and moisture, wind parameters, temperature, seasonal timing of burn, firing methods, relative humidity, etc.
- Rehabilitation would occur on constructed firelines after fires are out to prevent erosion, visual effects, and establishment of invasive plants.
- Fire and Resource Management staffs would discuss and design systematic monitoring systems to measure the effects of fire related vegetation management activities such as mechanical mastication and similar actions, herbicide use, and prescribed burning.
- Areas disturbed by suppression activities on wildfires should be monitored for establishment of new invasive plants.
- Incoming vehicles, engines, and equipment from outside the immediate area would be cleaned (including the undercarriage) before transport to the island to remove invasive weed seeds. They would also be cleaned immediately upon leaving the island before going to another assignment, or returning to home unit.
- Vehicles, engines, and equipment that have been operating on the island within a known area of invasive plants would be cleaned before going to another location on the island.

Wildlife/Wildlife Habitat

- Upon wildfire notification by the fire staff, Resource Management staff would examine maps and information resources to assess and discuss wildlife effects. READ(s) may be assigned to the incident management organization depending on potential effects on wildlife resources, especially Georgia and Federal listed species.
- Utilize water, pumps, and hose lines when available for wetlines or to back-up smaller firelines to minimize the amount of fireline construction and habitat disturbance by humans.
- Stream or water crossings should be avoided when possible by firelines or equipment. Crossings should promptly be restored and rehabilitated in consultation with resource specialists.
- Utilize existing roads, and direct fire related travel onto travel routes that are less sensitive to wildlife disturbance whenever possible for firefighters, vehicles, and equipment.
- Identify slash disposal areas that have no sensitive wildlife effects.
- Resource Management staff would be consulted when considering managing a wildfire for resource objectives; effects on wildlife will be an appropriate consideration.
- Mastication and brush cutting equipment use may be curtailed during prime nesting seasons, or other sensitive wildlife activity periods, upon consultation with Resource Management staff.
- The driving of vehicles and equipment on the beach would be coordinated with Resource Management staff and in accordance with regulations established by the Georgia Department of Natural Resources, to minimize disturbance of wildlife particularly during nesting periods for sea turtles and shorebirds.
- When planning and before initiating non-emergency field fire management activities, NPS biologists or resource specialists would be consulted to determine presence or

effects on sensitive species. If present, mitigation actions would be developed to minimize impacts on species of concern.
- Wildlife effects would be fully considered when developing prescribed fire plans and prescriptions through consultation with Resource Management and wildlife experts.
- Chemical retardant, foam, and gasoline refilling would not be conducted within 200 feet of standing water or streams to protect fisheries and aquatic animal life. Retardant or foam would not be dropped or applied within 300 feet of streams, ponds, or other standing water to protect fisheries and aquatic animal life.
- Helicopter dipping would only be allowed from approved water sources under established conditions to help prevent wildlife disturbance.
- Helicopter use would be minimized when possible, and flight levels kept high in raptor and waterfowl areas, to prevent collisions with aircraft.
- Other low-level aviation use may be curtailed by the fire staff, in consultation with Resource Management staff, if sensitive wildlife species could be impacted.

Special Status Species

- Generally, the same mitigations for special status species would occur as listed above under "Wildlife/Wildlife Habitat".
- When sensitive species locations, seasons, unique habitat, nesting areas, or other parameters are involved with a fire management project or wildfire, additional consultation with Resource Management and/or specific wildlife experts would occur. Written directions specifying appropriate and reasonable actions and/or mitigations would then be utilized by the fire management staff to minimize disturbance effects or maximize benefits to those sensitive species.
- After or during the wildfire or other activity, Resource Management staff would direct formal or informal consultation with the US Fish and Wildlife Service and/or the Georgia Department of Natural Resources, Wildlife Resources Division, depending on the status of the species, its recovery plan (if any), and previous agreements between the Seashore and the agencies.

Water Resources

- The preferred method of fireline rehabilitation would utilize replacement of cut slash or organic debris as the preferred method, but waterbars, check dams, or other diversion devices may be constructed if necessary in steep slope areas to prevent runoff and sedimentation.
- When planning prescribed fires, the proximity and effects on surface water resources would be a consideration when developing prescriptions.
- If water, pumps, and hose lines are utilized on fire control operations from surface water sources, appropriate containment systems would be utilized to prevent leaks of gas, oil or other fluids into waters.
- Resource managers would be consulted regarding effects of pumping from specific Seashore surface waters for fire control operations.
- Stream or water crossings should be avoided when possible by firelines or equipment. When necessary they should be carefully constructed to minimize disturbance and

erosion to the watercourse. Crossings should promptly be restored and rehabilitated in consultation with resource specialists.

- Felled trees, cut brush, and/or other slash would not be deposited in streams, ponds, or other water bodies.
- Equipment use would avoid operation on steep slopes or highly erosive soils with the potential to erode into surface waters.
- When possible, mowing or mastication would be utilized for firelines to avoid exposing mineral soils that may erode. When scraping is needed, it would be to the minimum depth necessary for safe fire control operations.
- Reasonable procedures would be developed to prevent spills of foam and fire retardant chemicals into surface waters.
- Chemical retardant, foam, and gasoline refilling would not be conducted within 200 feet of standing water or streams to protect fisheries and aquatic animal life. Retardant or foam would not be dropped or applied within 300 feet of streams, ponds, or other standing water.
- Helicopter dipping would only be allowed from approved water sources. The preferred priority order would be a dip tank from island pipe/hydrant/well systems (capacity often inadequate), island natural fresh water sources (low water levels, wildlife and aquatic concerns may not allow), river water (often brackish, but plentiful), mainland natural fresh water sources (travel distance usually excessive given critical need), and ocean salt water (unlikely due to aviation risk safety concerns). The NPS staff is considering constructing and installing a standpipe and tank in Stafford field as a water source for fire management activities, as funding allows.
- Helicopter buckets would be pre-washed in a disinfectant solution before use on island water sources, per standard aviation procedures, to prevent cross-contamination of water resources or transfer of exotic organisms.

Wetland

- The same mitigations for wetland resources would occur as listed above under "Water Resources".

Wilderness

- Firefighters would utilize MIST to minimize impacts of fire response operations in Seashore Wilderness.
- Applicable MIST tactics would be detailed for firefighters in wildfire and prescribed fire Incident Action Plans, and in incident briefings.
- The necessity for wildfire management and fuels management projects, including prescribed fire, in Wilderness is described in the minimum requirements analysis (Step 1) that is found in this document on page 101.
- Typical tools and methods that may be used during the initial response to a Wilderness wildfire are specified in the minimum requirements analysis (Step 2), which will be completed during the writing of the FMP.
- In the event that the Seashore incurs a long-duration Wilderness wildfire (one that will last for more than a few operational periods), the FMP would recommend that long-term incident planning consider methods and tools that may differ from, and be less intrusive

than, those used during the initial response. A new minimum tool analysis may then be used in lieu of the one in this document.

- A method and tools analysis (MRA Step 2) is required for fuels projects in Wilderness. Specific conditions and locations of fuels projects have been developed for the purposes of this Fire Management Plan; however, these conditions may be applied to future projects as well. If a future project deviates from the analysis parameters herein, then a separate methods and tools analysis will be completed.
- Whenever possible, Resource Advisors (READ's) would be assigned to all wildfires of significance in Seashore Wilderness, where on the ground actions by firefighters occur.
- Natural, manmade features or vegetation change barriers would be utilized whenever possible for fire control lines to minimize the need for fireline construction, and minimize vegetation cutting in Seashore Wilderness. Indirect/confine type strategies would be the preferred strategy for most wildfires.
- Wildfires that are managed for resource objectives would consider Wilderness values when strategies and planning areas are developed.
- For visitor safety, Wilderness visitors that may be in the path of a wildfire would be located and escorted out of the Wilderness. The Superintendent would establish an appropriate and reasonable closure order that would be enforced by park rangers.
- Herbicide would only be utilized for limited projects in limited areas, after undergoing the NPS national and regional approval process, considering the effects on Wilderness resources, and the minimum requirements analysis.
- Herbicide and application devices would be worked on, filled and mixed only utilizing approved leak prevention and catchment systems.
- No visible leakage of chemicals would be allowed from equipment used for transporting, storing, mixing, or applying chemicals.
- Staff utilizing herbicide would be trained in approved procedures related to proper handling, storage, transportation, mixing, spill prevention, and application procedures.
- The preferred method of fireline rehabilitation would utilize replacement of cut slash or organic debris as the preferred method in Wilderness to limit the potential visual effects of a fireline, and to speed its natural re-vegetation.
- Constructed firelines would be rehabilitated as soon as possible after fires are out to prevent erosion and negative visual effects.
- When planning prescribed fires in Wilderness, the longevity and disturbance effect of control preparations and operations on Wilderness values must be a consideration.
- Prescribed fire may be used in Wilderness to re-introduce fire to an area due to the buildup of hazardous fuels; utilizing wildfire for resource objectives as the first entry would likely lead to more stand replacing fire and destruction of remnants of unique habitats. The eventual goal would be to utilize wildfires to maintain the fire adapted and unique habitats in Wilderness.
- Mastication in Wilderness would only be considered after application of the minimum requirements analysis, approved by the Superintendent, as a management tool that is necessary for the improvement and restoration of Wilderness values and safety of fire fighters.
- If mastication is necessary for a Wilderness prescribed burn, timing of the mastication should be such as to complement the prescribed burn window, season and availability of resources so that repeat mastication is not necessary for the same prescribed burn.

- Mastication along Wilderness trails as a pre-identified fireline for wildfire control would be planned to minimize the total number of control lines in Wilderness.
- Equipment operators would be trained to minimize soil and vegetation disturbance, soil compaction, disturbance, and displacement so that visible effects of equipment use in Wilderness are minimal.
- Equipment with fluid leaks would not be utilized. Refueling or filling or mixing of gas and other fluids would be avoided in the field when possible; when necessary, appropriate precautions would be taken to prevent spills.
- Equipment use in or adjacent to Wilderness would be minimized to protect natural Wilderness soundscape.
- Aviation use above or adjacent to Wilderness would be minimized to protect natural Wilderness soundscape.

Soundscapes

- Planned fire management equipment use in non-emergency activities would consider the effects on natural ambient soundscape during the project planning phase.
- Every aviation use at the seashore would be analyzed for necessity to protect aviation crew safety and to consider the effects on the natural soundscape, even if short-term.
- If possible, mastication type equipment would not be used during heavy public visitation periods.
- The fire management staff would combine administrative trips with other park staff on Seashore business on island roads when possible, to minimize driving noise and trips on the island.

Archeological and Historic Structure Resources

- Compliance with section 106 of the National Historic Preservation Act would occur before prescribed burn or fuel treatment projects.
- Identify cultural sites in advance of wildfire, prescribed fire, or fuels treatment activities in order to plan and devise avoidance and mitigation strategies where possible.
- Seashore will consider development of a wildfire related programmatic agreement with the Georgia State Historic Preservation Office to help identify effects, actions and considerations of wildfires with resource objectives on Seashore historic and archeological resources.
- If a wildfire or prescribed fire is likely to spread into an area where historic structures such as buildings need to be protected, then fire management must immediately consult with resource management and facility management staff to develop a structure protection plan that best protects the historic materials present, (for instance, water can be very damaging to some structures).
- Utilize water, pumps, and hose lines when available for wetlines or to back-up smaller firelines to minimize the amount of fireline construction and ground disturbance.
- Educate fire personnel about the significance of cultural sites, how to identify those sites, and appropriate actions and notifications to be made if new sites are encountered.
- Avoid building firelines and doing any ground disturbance in cultural site areas.
- Utilize defensive and protection tactics, and collaborating with cultural specialists, to prevent damage to historic, cultural, archeological, ethnographic, or landscape sites.

- Collaborate and coordinate with Seashore affiliated tribes to prevent damage to ethnographic resources, even if unrecorded, before planned projects.
- When possible, mowing or mastication would be utilized for firelines to avoid exposing mineral soils.
- Flush cut stumps in cultural sites rather than remove them. Avoid ground disturbance as much as possible in and around cultural sites.
- Identify slash disposal areas that have no cultural resources.
- During wildfires, fire managers would regularly update the Seashore resource specialist with cultural responsibilities on initial and extended attack response strategies, ground disturbance, and actual and predicted extent of fire area. This will help facilitate the focus on involved cultural resources.
- Seashore cultural and historic site base maps would be immediately available to fire managers and incident commanders to allow them to avoid impacts to cultural sites.
- If heavy equipment is approved by the Superintendent for use, spot monitoring or accompaniment by READ(s) would occur to ensure avoidance of damage to archeological or cultural sites.
- Special flagging would be utilized to identify archeological and historic sites; flagging must be monitored as fire threat passes and may need early removal to prevent undue attention to cultural sites.
- After major wildfires, BAER activities would be considered in consultation with regional office and resource specialists, and a cultural resource specialist(s) may need included on the BAER team.

Cultural Landscapes

- Many of the same mitigations outlined above in "Archeological and Historic Resources" would be utilized to protect cultural landscapes, or elements of cultural landscapes.
- If fire or fire management activities are to occur in a National Register Cultural Landscape, it is critical to consult immediately with the Resource Manager or a cultural specialist with knowledge of that landscape to ensure that actions are compatible with the broader purpose of that specific landscape.
- Fire management staff will have access to maps showing the Seashore cultural landscapes, so that they know when and where to initiate cultural landscape consultation.
- With cultural landscapes, a wider perspective of any fire management ground or vegetation disturbing actions would be taken, with the goal of enhancing the cultural landscape for the long-term.
- After major wildfires, BAER activities would be considered in consultation with regional office and resource specialists, and a cultural landscape specialist may need included on the BAER team.

Visitor Use and Experience

- Continually emphasize the safety of fire staff and the public as the highest priority in all fire management activities.
- Herbicide would only be used after visitors were out of the area, or informed in advance, and appropriate informational signing was placed at human entryways to the spray area.

- Seashore neighbors, visitors, and local residents would be notified of all fire management activities that have the potential to impact them.
- Fire staff would ensure adequate public notification procedures occur for all Seashore prescribed burns.
- For long duration wildfires, regular media releases would inform the local public and visitors about the expected impacts of the fire, especially related to smoke and closures or restrictions. Signs or notices may be posted at appropriate places on the island to inform incoming visitors of the fire situation. Announcements would also occur during visitor orientations on the mainland and island. Superintendent could authorize temporary closure of some areas to public and visitors.
- To prevent accidental exposure to hazards, visitors would be kept out of the immediate vicinity when fire management activities are underway such as mastication, tree falling, low level aviation operations, and equipment use.
- The Seashore would monitor fuel, weather, and fire condition parameters and may limit public access and activities in the Seashore when extreme conditions develop, as designated in Preparedness Level planning, which is included in the FMP.
- Initial attack staff would determine the proximity of fire to visitors, adjacent landowners, and communities. They would coordinate with rangers and local agencies to inform them of the potential hazard and evacuate as necessary.
- As burned areas are opened to visitors after a fire, signs would be posted informing the public of potential hazards in the burned areas, (snags, stump holes, etc.).
- The fire management staff would combine administrative trips with other park staff on Seashore business on island roads when possible, to minimize driving trips on the island.

Park Operations

- Continually emphasize the safety of firefighters, the park staff, and the public as the highest priority in all fire management and park activities.
- Park staff should continue to realize that fire management is a core responsibility of all NPS employees. When significant wildfires or prescribed fires occur at the Seashore, the Superintendent and staff may need to re-prioritize and re-program work to activities focused on incident management and support.
- Prescribed Fire, managing wildfires for resource objectives, fuels and defensible space projects would be implemented in a measured, reasoned manner, based on fiscal and staffing constraints, and a well-structured building of the fire management program over the longer term.
- Fire management officer would work with park divisions to identify and train appropriate additional staff to at least basic red-card levels, so that there is a larger group of park firefighters immediately available for Seashore fire incidents.
- For non-Seashore firefighters and fire managers who may be temporarily assigned to Seashore incidents or duties, fire management would develop a briefing format and informational packet specific to Seashore values and logistics. This would bring incoming off-island resources up to speed as soon as practical and make them safer and more effective in following Seashore objectives, and protecting Seashore values.
- Fire management officer would work with all park divisions to develop non-red carded incident support personnel that can assist with incident operations, (planning, fiscal, logistics, etc.).

- Since the Seashore has such a small fire staff, FMO would develop and maintain a list of "local" on call persons from cooperating agencies in the state/region with appropriate fire management qualifications who can assist the Seashore on larger or long duration incidents.
- Since the fire staff is small, there needs to be continued emphasis on pre-planning fire related activities, projects, support, relationships, and incident response.
- The fire management staff would enhance preparedness by continuing to build and maintain an appropriate cache of fire supplies, tools, materials, and equipment to meet normal response requirements.
- Resource management would continue to emphasize and support training for park staff to develop the needed Resource Management subject matter expertise to assist on mitigations to maintain, protect, and preserve Seashore values during incidents, (Wilderness, cultural, water, wildlife, unique habitats, etc.).
- Resource management would develop a list of on-call READs and subject matter specialists to assist in wildfire incident advising, especially those who can safely operate in the field during a wildfire.
- Resource and fire management staff would integrate knowledge gained through monitoring, research, and experience into future fire management decisions and actions that improve the program.
- Since the Seashore contains such a mix of fire adapted ecosystems, park interpretive staff need to understand the relationship of fire to the many Seashore habitats and natural environment in order to convey those complexities to visitors and residents in various educational media and formats, (e.g., VC, media releases, programs, online, exhibits, brochures, visitor contacts, etc.).
- The fire management staff would combine administrative trips with other park staff on Seashore business on island roads when possible, to minimize driving trips on the island.

Public Health and Safety

- Emphasize the safety of fire staff and the public as the highest priority in all fire management activities.
- Initial attack staff would determine the proximity of fires to visitors, island residents, adjacent landowners, and communities. They would coordinate with Seashore Law Enforcement Rangers and local agencies to inform them of the potential hazard and evacuate as necessary.
- Seashore neighbors, visitors, and local residents would be notified of all fire management activities that have the potential to impact them.
- Visitors that may be in the path of a wildfire would be located and escorted out of the risk area.
- The Seashore would monitor fuel, weather, and fire condition parameters and may limit public access and activities in the Seashore when extreme conditions develop, as delegated in Preparedness Level planning.
- The Superintendent may establish appropriate and reasonable closure orders that would be enforced by park rangers.
- All fire management activities, including wildfires managed, or partially managed, for resource objectives, would fully consider risk and effects to private property and retained rights properties at the Seashore. This consideration would occur regardless of which

FMU the private right is located in, and would occur on an ongoing basis for the duration of the activity or incident.

- Defensible space planning and hazardous fuel reduction would be an ongoing and continuous activity for Seashore buildings and infrastructure. The NPS would coordinate with the Georgia Forestry Commission on developing defensible space and hazard fuel reduction for Seashore private properties.
- An herbicide application map and treatment plan would be developed for each treatment area and would be posted or distributed as necessary and helpful.
- Herbicide would only be used after visitors were out of the area and appropriate informational signing was placed at human entryways to the spraying area.
- Fire staff would perform other agency and public notification procedures for all Seashore prescribed burns.
- Prescribed fire burn boss would work with local residents in close proximity to burns to ensure their safety, both in planning and during the implementation.
- The fire management staff would work with ranger staff and local agencies on posting smoke hazard signs if necessary
- The fire management staff would work with ranger staff and local agencies on advising boat traffic on smoke hazards if necessary, possibly via marine radio.
- For long duration fires, regular media releases would occur that inform locals and visitors about the expected impacts of the fire, especially related to smoke and closures or restrictions. Signs or notices may be posted at appropriate places on the island to inform incoming visitors of the fire situation. Announcements during visitor orientations on the mainland and island would also occur.
- Visitors would be kept out of the immediate vicinity when fire management activities such as mastication, tree falling, low-level aviation operations, and equipment use occur to prevent accidents.
- As burned areas are opened to visitors after a fire has been completely extinguished, signs would be posted informing the public of potential hazards in the burned areas.

2.7 Environmentally Preferred Alternative

According to the CEQ regulations implementing NEPA (43 CFR 46.30), the environmentally preferred alternative is the alternative "that causes the least damage to the biological and physical environment and best protects, preserves, and enhances historical, cultural, and natural resources. The environmentally preferred alternative is identified upon consideration and weighing by the Responsible Official of long-term environmental impacts against short-term impacts in evaluating what is the best protection of these resources. In some situations, such as when different alternatives impact different resources to different degrees, there may be more than one environmentally preferred alternative."

The Preferred Alternative, utilizing prescribed burning, managing wildfire for resource management objectives, manual and mechanical vegetation treatments, and targeted herbicide as additional treatment tools, is the environmentally Preferred Alternative for several reasons: 1) it would increase successful restoration and protection of Seashore natural and cultural values and adjacent private property; 2) it would increase the resilience of fire dependent ecosystems to future natural disturbances such as wildfire, drought, insect outbreaks, and wind events; 3) it would restore fire-adapted and unique ecosystems and associated wildlife; and 4) reduce a significant fuel hazard in

dense brush ground cover, making prescribed burning safer for employees and nearby residents and wildfire control more successful. For these reasons, the preferred alternative causes the least damage to the biological and physical environment and best protects, preserves, and enhances historical, cultural, and natural resources, thereby making it the environmentally preferable alternative.

Under Alternative 3, the fire management program would use all the same treatment tools as the Preferred Alternative except for mechanical treatments in the Wilderness area. However, Alternative 3 would continue to 1) increase the risk of future high severity wildfires in the Wilderness area; 2) reduce amount of successful ecological restoration and protection of fire-adapted and unique ecosystems in the Wilderness area; 3) retain hazardous fuel loads within the Wilderness area, increasing health and safety risks for visitors and fire fighters, adjacent landowners, private property, and NPS infrastructure; and 4) have the potential to reduce integrity of natural resource values that are important to maintaining wilderness characteristics. Under alternative 3, the Seashore could degrade the wilderness characteristics for which it was established and increase the health and safety risks for visitors, private residents, and NPS employees due to increased potential for future increased severity wildfires.

Under the No Action Alternative, the fire management program would continue to use the presently approved fire management tools of fire suppression, however, 1) it would increase the risk of future high, severity wildfires; 2) reduce the amount, extent, and effectiveness of successful ecological restoration; 3) continue to reduce resilience of the Seashore's ecosystem to hurricanes, drought, pest outbreaks, and wildfire; and 4) increase health and safety risks for visitors, adjacent landowners, private property, and NPS infrastructure due to increased wildfire risks.

Under Alternative 1, the Seashore would not be entirely consistent with the Wildland Fire Management NPS directive. This directive states a mission goal of restoring and maintaining fire-adapted ecosystems using appropriate tools and techniques in a manner that will provide sustainable, environmental and social benefits (RM-18).

Therefore, Alternative 2, a new FMP including the use of prescribed burning, managing wildfire for resource objectives, targeted herbicide application, use of manual and mechanical tools as well as continued responses to unplanned ignitions, is the NPS' Preferred Alternative.

Table 3 compares the ability of these alternatives to meet the project objectives (the objectives for this project are identified in the Purpose and Need chapter). As shown in the following table, the Preferred Alternative meets each of the objectives identified for this project, while the No Action and Action Alternative 3 do not address all of the objectives.

Table 3. Methods Each Alternative Uses to Ensure Each Objective Is Met

Alternative 1 No Action	Alternative 2 Preferred Alternative—All tools	Alternative 3 No Mechanical in Wilderness
Under the no-action alternative, the fire management plan would continue to use the presently approved fire management tool of fire suppression. This would greatly reduce ecological restoration and defensible space actions that are necessary to fulfill direction in the Seashore's enabling legislation and NPS 2006 management policies.	Under the preferred alternative, the fire management program would use fire suppression plus additional tools including prescribed fire, manual and mechanical treatments, managing wildfire for resource objectives, and targeted herbicide application as a follow-up treatment.	Under alternative 3, the fire management program would employee all the same activities as the Preferred Alternative, except there would be no mechanical treatments in the Wilderness.

Meet Objectives?			
Objectives	**Alternative 1**	**Alternative 2**	**Alternative 3**
To protect human life and safely conduct all wildland fire management activities	Continued retention and buildup of hazardous fuels would increase risk of larger and/or intense wildfires; the lack of efficient fuel breaks would reduce ability of fire fighters to control wildfires. Minimal defensible space could lead to increased threat to structures and humans. All this could contribute to less effective suppression that could expose fire fighters and the public to elevated risk.	Ability to use additional fire management tools as described above would decrease hazardous fuels, increase number and quality of effective fuel breaks, and decrease probability of large and intense fires over time. This would increase ability of fire fighters to control prescribed burns and wildfires safely and decrease health and safety risks for visitors, private residents, and NPS employees.	Ability to use additional fire management tools in much of the Seashore would allow flexibility in ensuring firefighter and public safety in those areas. The inability to use mechanical treatments in the Wilderness would likely lead to retention and buildup of hazardous fuels, which might result in larger and more intense wildfires. Lack of effective fuel breaks might lead to increased fire risk within and adjacent to the Wilderness if large wildfires developed that were unable to be stopped. Successful Wilderness prescribed burning is less likely with lack of internal fuel breaks. These issues would likely lead to increased health and safety risks for visitors, private residents, and NPS employees.
To utilize activities that protect Seashore private property rights, but enhance Seashore natural and cultural values	Continued retention and buildup of hazardous fuels throughout the Seashore would increase risk of large and intense wildfires. This would increase fire risk to private property structures, NPS infrastructure, and cultural and natural resources. There would also be reduced resilience of Seashore fire-adapted	Use of additional fire management tools would increase successful ecological restoration and maintenance efforts, and hazardous fuels reduction, making fire control and prescribed burning safer for employees and residents. Reduced hazardous fuel loads would increase successful restoration of natural	Same as Alternative 2, however the inability to use mechanical treatments in the Wilderness would make reduction of hazardous fuels less effective in approximately 20,500 acres of the Seashore. This could lead to increased fire risks for private property structures and cultural and natural resources in and

Alternative 1 No Action	Alternative 2 Preferred Alternative—All tools	Alternative 3 No Mechanical in Wilderness
Under the no-action alternative, the fire management plan would continue to use the presently approved fire management tool of fire suppression. This would greatly reduce ecological restoration and defensible space actions that are necessary to fulfill direction in the Seashore's enabling legislation and NPS 2006 management policies.	Under the preferred alternative, the fire management program would use fire suppression plus additional tools including prescribed fire, manual and mechanical treatments, managing wildfire for resource objectives, and targeted herbicide application as a follow-up treatment.	Under alternative 3, the fire management program would employee all the same activities as the Preferred Alternative, except there would be no mechanical treatments in the Wilderness.

Meet Objectives?

Objectives	Alternative 1	Alternative 2	Alternative 3
	ecosystems.	processes that could enhance Seashore natural and cultural resource values and wilderness characteristics.	adjacent to the Wilderness. There would also be reduced restoration of natural processes in the Wilderness, which may cause a decrease in natural and cultural values and wilderness characteristics.
To create/maintain defensible space and fuel breaks, to promote ecological restoration and maintenance, and to reduce hazard fuels	Mechanical hazardous fuel reduction done in WUI under current FMP would no longer be authorized. Fire management actions limited to full wildfire suppression would allow continued buildup and retention of hazardous fuels. This would reduce the potential to create defensible space, restore natural ecological processes to the Seashore landscape, and increase fire risk to natural and cultural values.	Mechanical equipment would be used to create/maintain defensible space and fuel breaks; targeted herbicide use would be used to maintain fuel breaks and defensible space. These and additional fire management actions would allow reduction of hazardous fuels, restoring natural ecological processes.	Same as Alternative 2, however the inability to use mechanical treatments in the Wilderness would make reduction of hazardous fuels less effective in approximately 20,500 acres of the Seashore. The lack of Wilderness fuel breaks would hinder prescribed and wildfire management. This would not promote restoration or maintenance of natural ecological processes and protection of fire-adapted and unique ecosystems in this area.
To consider more active vegetation management activities including prescribed burning, wildfire managed for resource objectives, mechanical and manual equipment use on vegetation, and targeted herbicide use	Limited to full wildfire suppression and management options allowed under National Fire Policy. Most of the management activities in the objective would not be allowed.	This alternative considers all active vegetation management activities listed in the objective.	Same as Alternative 2, however the inability to use mechanical in the Wilderness would make reduction of hazardous fuels less effective and limit prescribed burning as a vegetation management activity.
To provide effective rehabilitation of wildfire areas (rehabilitation of fire suppression impacts and BAER)	This alternative would allow for effective rehabilitation activities after wildfires. It is likely that wildfires would be larger and more severe, leading to increased rehabilitation activities and associated costs.	Same as Alternative 1, except that over time fire size and severity may decrease leading to less rehab activities.	Same as Alternative 2, except that limited mechanical in the Wilderness might lead to larger and more severe wildfires in those areas, leading to increased rehabilitation activities and costs in some areas.

Alternative 1 No Action	Alternative 2 Preferred Alternative—All tools	Alternative 3 No Mechanical in Wilderness
Under the no-action alternative, the fire management plan would continue to use the presently approved fire management tool of fire suppression. This would greatly reduce ecological restoration and defensible space actions that are necessary to fulfill direction in the Seashore's enabling legislation and NPS 2006 management policies.	Under the preferred alternative, the fire management program would use fire suppression plus additional tools including prescribed fire, manual and mechanical treatments, managing wildfire for resource objectives, and targeted herbicide application as a follow-up treatment.	Under alternative 3, the fire management program would employee all the same activities as the Preferred Alternative, except there would be no mechanical treatments in the Wilderness.

Meet Objectives?			
Objectives	**Alternative 1**	**Alternative 2**	**Alternative 3**
To continue and increase interagency cooperation and coordination, and public outreach about Seashore fire management and restoration activities	This alternative would allow for continued and increased interagency cooperation and coordination, and public outreach about the Seashore fire management activities.	Same as Alternative 1, except for more emphasis on restoration, hazardous fuel reduction, and defensible space activities as they would be a leading component of the program.	Same as Alternative 2, except that activities would be limited in the Wilderness.
To update FMP terminology and policy language and discussions	This alternative would allow for updated terminology and policy language. However, fire management policy updates would be limited to full suppression strategy and tactics only.	This alternative would allow for updating terminology and policy to conform to current interagency standards. This would also allow for consistent interagency communications to the public, staff, and cooperators allowing for more efficient communications.	Same as Alternative 2
To continue active research and monitoring of fire program field actions, by supporting sound resource management and research science, and utilize adaptive management to improve the program	This alternative would allow for continued interagency cooperation and coordination, and public outreach regarding the Seashore fire management activities. Restoration activities would not occur, so it would not support current scientific understanding of fire-adapted ecosystems.	Same as Alternative 1, except that additional fire management tools and methodologies would be employed implementing scientifically accepted management practices.	Same as Alternative 2, except that mechanical fuel reduction tools would not be used in the Wilderness. Adaptive management options would be limited in the Wilderness.
Does the alternative meet project objectives?	No	Yes	No, because lack of mechanical treatments in the Wilderness.

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Table 4. Comparison of Proposed Fire Management Components by Alternatives

Components	Alternative 1	Alternative 2	Alternative 3
Prescribed Burn	Prescribed burns would not be used as a fire management tool. Hazardous fuels would continue to be retained and to build up in density, increasing the potential intensity and difficulty to control/suppress future wildfires. Seashore ecosystems resilience to hurricanes, drought, pest outbreaks, and wildfire would continue to decrease.	Prescribed burns would be used to reduce hazardous fuels and to restore fire to fire-adapted ecosystems. Implementing prescribed fire would be a priority in restoring and protecting ecosystems and unique habitats (e.g., wetlands, pine savannas). Prescribed burning would become safer and more effective as understory and mid-story brush is reduced. Fuel breaks and defensible space are initially maintained by mechanical treatments and targeted herbicide application, decreasing the risk of prescribed burns.	Same as Alternative 2. However, Wilderness prescribed burns, which includes the wilderness area would be limited because the Wilderness would not be effectively broken into smaller "burn blocks" without mechanical treatments along roads/trails. Hazardous fuels reduction would likely be more limited in the Wilderness.
Wildfire Managed for Resource Objectives	All wildfires within the Seashore boundaries would be suppressed, so restoration of natural ecological processes and habitat and hazardous fuel reduction would be less. Because of the buildup of hazardous fuels, wildfires would be more likely to be high severity/stand replacement type fires.	Wildfires would be allowed to burn with limitations to accomplish specific resource management objectives. The use of wildfire for resource objectives would be one more "natural method" to reduce hazardous fuels	Same as Alternative 2. However, wildfire control actions in the Wilderness would be more challenging and limited due to no mechanical treatments, leading to larger burn blocks with less likelihood of stopping fires within the Wilderness. Thus larger wildfires and more stand replacing, due to limited prescribed fire.
Fire Suppression Tactics	All wildfires within Seashore boundaries would be suppressed using the appropriate response, utilizing both direct and	Same as No Action Alternative, except that fire control actions may be easier with allowed reduction of vegetation	Same As Alternative 2 outside the Wilderness, but increased risk and

Components	Alternative 1	Alternative 2	Alternative 3
	indirect tactics, depending on the specifics of each fire. Tactical alternatives that require suppression actions on private lands would be coordinated with local fire agencies, Georgia Forestry Commission, and landowners. Fire control actions in certain areas would be more challenging due to less reduction of understory and mid-story brush.	due to utilization of more active vegetation management tools, (e.g., prescribed fire)	fire severity inside the Wilderness due to inability to create fuel breaks.
Mechanical and Manual (Mechanical includes wheeled and tracked equipment, such as tractor plow or bulldozer, grinders, bush hog, and masticators and/or handheld motorized equipment such as weed eaters, chainsaws, hand-held brush cutters, leaf blowers) (Manual includes ax, pulaski, cross-cut saw, pruners, shovel)	Mechanical or manual treatments would not be used to reduce hazardous fuel in WUI areas, prep units for prescribed burning (including defensible space and fuel breaks), or to assist on ecological restoration goals within the Seashore. Hazardous fuels would continue to be retained and to build up in density, increasing the potential intensity and difficulty to control/suppress future wildfires. Fire control actions in certain areas would be more challenging due to less reduction of understory and mid-story brush.	Mechanical and manual treatments would be used to reduce hazardous fuel in WUI zones, prep units for prescribed burning, to reduce the vegetation and hazardous fuels along wilderness roads/trails, or to accelerate ecological restoration goals within the Seashore. Focused treatment may occur near developments, cultural, natural, and other resources. Internal NPS and programmatic processes would be utilized to plan in advance and ensure protection of natural and cultural resources.	Mechanical treatments would not be used in the Wilderness, but would be utilized in other Seashore areas. Hazardous fuels adjacent to selected existing (abandoned) roads and trails in the Wilderness would not be reduced with mechanical equipment. Safe and effective areas in the Wilderness to stop wildfire on the ground would remain limited, increasing the potential for wildfires to escape the Wilderness boundary and to burn more acres compared to Alternative 2. Implementing prescribed burns for ecological restoration and hazardous fuel reduction would also be limited in the Wilderness.

Components	Alternative 1	Alternative 2	Alternative 3
Chemical	Chemical treatments would not be used as a fuel management tool, so fuel reduction acreage associated with fuel breaks would be less.	Targeted herbicide treatments used as a follow-up treatment may be utilized, following NPS approval processes, to help maintain fuel breaks and defensible space by aiding in understory and/or mid-story brush along fuel breaks. Treated fuel breaks would be more effective combined with mechanical work.	Same as Alternative 2. However, no chemical treatments would occur in the Wilderness as mechanical treatments to create and/or maintain fuel breaks would not occur.

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2.8 Summary of Environmental Consequences by Alternative

Table 5 summarizes the anticipated environmental impacts for alternatives 1—3. Only those impact topics that have been carried forward for further analysis are included in this table. The Environmental Consequences chapter provides a more detailed explanation of these impacts.

Table 5. Summary Comparison of Impacts

Resource Topic	Alternative 1 No Action	Alternative 2 Preferred Alternative	Alternative 3 No Mechanical in Wilderness
Air Quality	Alternative 1 would result in long-term, minor to moderate, localized, adverse impacts to air quality because larger and more intense wildfires would be expected to occur resulting in greater emissions of air pollutants, smoke, and odors and impacts to visibility.	Alternative 2 would result in direct, short-term, localized, and negligible to minor adverse impacts from prescribed burns to air quality. Impacts from wildfires managed for resource benefits would vary depending on the specific vegetation area/fire adapted habitat that may be burned, its recent fire and fuel treatment history, the eventual size of the wildfire incident, etc. Impacts would likely be beneficial, short- to long-term, moderate impacts. Overall, Alternative 2 would likely lead to lower and less intense wildfire emissions due to a decrease in fuel loadings, which would have beneficial indirect, long-term, regional, and moderate impacts to air quality.	Same as Alternative 2 plus Alternative 3 would result in indirect, short- to long-term, localized, and minor to moderate, adverse impacts to air quality because the lack of fuel breaks in the Wilderness would be expected to have larger and more intense wildfires, thus greater emissions of air pollutants, smoke, and odors and impacts to visibility.
Soil Resources	Alternative 1 would result in direct, negligible to minor, adverse, and localized impacts from wildfire suppression tactics as well as indirect, adverse, minor to moderate, localized, and long-term impacts because larger and more intense wildfires would be expected to occur resulting in greater soil impacts (e.g., vegetation/litter/duff layer removal, developing hydrophobic soil layers).	Same as Alternative 1 for wildfire impacts plus Alternative 2 would result in short-term, localized, minor, and adverse impacts from prescribed burns and managed fires and associated activities to soil resources. There would also be beneficial long-term, moderate impacts from the reestablishment of a fire-driven nutrient cycle and increased stability of the soil strata, given increased native herbaceous ground cover, and the reduced frequency of unplanned fire suppression activities.	Same as Alternative 2 plus Alternative 3 would result in indirect adverse, negligible to moderate, localized, and short- to long-term impacts to soils because increased potential for locally severe fires could occur in the Wilderness due to lack of fuel breaks hindering prescribed burns and wildfires managed for resource benefits.
Vegetation Resources	Alternative 1 would result in indirect adverse, negligible to minor to major, localized, and long-term impacts to vegetation because larger and more intense wildfires could occur resulting in physical alteration of vegetation structure, composition, and function and increased susceptibility to spread of invasive plants. There would also be adverse localized, short-term, and minor impacts to vegetation from brackish water bucket drops because vegetation is used to naturally occurring levels of salt in the environment and bucket drops would not occur continuously in one location. Climate change—Impacts would be indirect, adverse, minor to moderate, short- to long-term, and localized because increased fuels and potential for larger and more intense fire behavior.	Same as Alternative 1 for wildfire suppression plus Alternative 2 would result in short-term loss of individuals and/or communities of plants with minor to moderate beneficial, long-term, localized impacts to vegetation by restoring native vegetation structure, composition, diversity, and function of historically fire-maintained vegetation associations and restoring a more natural fire regime and ecological process. Beneficial impacts would be due to minimizing the potential for future severe wildfires and increasing the potential for lower intensity ground fires over time as the amount of area restored increases and fuel hazard reduction increases. Climate Change—Impacts due to reduced fuels and fire behavior potential in treated areas would be indirect, beneficial, long-term, and localized.	Same as Alternative 2 plus Alternative 3 would result in indirect adverse, minor to moderate, localized, and long-term effects to vegetation due to increased potential for locally severe fire effects on vegetation in the Wilderness. Over the entire Seashore, impacts to vegetation would be direct, moderate, long-term, beneficial, and localized.
Wildlife/Wildlife Habitat	Alternative 1 would result in indirect, adverse, minor to moderate, localized, and long-term impacts to wildlife and wildlife habitat because larger and more intense wildfires could occur and direct, short-term, minor, adverse, localized impacts from increased human presence in areas required to support fire suppression efforts.	Same as Alternative for wildfire suppression plus Alternative 2 would result in minor to moderate, beneficial, long-term, localized impacts by restoring the variety and diversity of vegetation communities and wildlife habitat present and the likelihood of intense or larger wildfires would decrease with time as prescribed burns, wildfires managed for resource objectives, and completed vegetation management actions were completed.	Same as Alternative 2 plus Alternative 3 would result in indirect adverse, minor to moderate, localized, and long-term impacts effects to wildlife habitat due to increased potential for locally severe fire effects on wildlife habitat, including physical alteration of vegetation structure and composition in the Wilderness. The actual effects of no mechanical treatments on wildlife in the Wilderness would depend on the location, timing, extent and severity of future wildfires.
Special Status Species	Alternative 1 would result in minor to moderate, short- to long-term, adverse, and localized impacts on red-cockaded woodpecker, gopher tortoise, and wood stork habitat due to potential destruction of nesting and roosting habitat and reduced suitable foraging habitat. The No Action alternative would have no or negligible impacts on piping plovers, red-cockaded woodpeckers, wood storks, Eastern indigo snake, and loggerhead sea turtles. Negligible or no impacts because no red-cockaded woodpeckers or Eastern indigo snakes inhabit the Seashore, no wood storks are known to roost or nest in the Seashore, and no areas of the beach being used by piping plovers or loggerhead sea turtles would be used during wildfire suppression activities.	Same as Alternative 1 related to wildfire suppression plus Alternative 2 would result in long-term, minor to moderate beneficial effects for the six federally listed species and/or their habitat because the likelihood of intense or larger wildfires would decrease with time as prescribed burns, wildfires managed for resource objectives, and vegetation management actions were completed. Active vegetation management tools would also foster restoration of longleaf pine and other native fire-adapted vegetation communities important to the federally listed species.	Same as Alternative 2 plus Alternative 3 would result in indirect adverse, minor to moderate, localized, and long-term effects to habitat due to increased potential for locally severe fire effects on habitat of special status species, including physical alteration of vegetation structure and composition. The actual effects of no mechanical treatments on special status species and/or their habitat in the Wilderness would depend on the location, timing, extent and severity of future wildfires.

Resource Topic	Alternative 1 No Action	Alternative 2 Preferred Alternative	Alternative 3 No Mechanical in Wilderness
Water Resources (includes Wetlands)	Alternative 1 would result in indirect adverse, negligible to minor to moderate, localized, long-term impacts to water resources due to increased potential for larger and more severe fire resulting in increased soil erosion, turbidity, and sedimentation, reduced water quality, and potential pulses of water. Direct adverse effects of brackish water buckets used to suppress wildfires would be localized, short-term, and minor to water quality.	Same as Alternative 1 for wildfire suppression plus Alternative 2 would result in indirect, minor to moderate, beneficial, long-term, and localized impacts by increasing the potential for lower intensity ground fires and increasing the overall health and vigor of vegetation communities. There would also be direct, minor, adverse, short-term, and localized impacts to water resources due to temporary increases in temperatures, soil erosion, and sediment yield from prescribed fire and wildfires managed for resource objectives reducing vegetation along the riparian/wetland banks and shoreline.	Same as Alternative 2 plus Alternative 3 would result in adverse, minor to moderate, localized, and short- to long-term due to increased potential for locally severe fire effects on water resources in the Wilderness.
Wilderness	Alternative 1 would result in moderate to major, long-term, direct, adverse impacts on wilderness values due to increased potential for future severe wildfires from potential fuel buildup and increased human presence required for fire suppression efforts.	Same as Alternative for wildfire suppression plus Alternative 2 would result in long-term, minor to moderate adverse effects on the untrammeled and undeveloped qualities, as well as to opportunities for solitude and unconfined recreation due to fuel management activities. Beneficial impacts to the natural quality of wilderness character. The proposed actions would also provide for long-term, beneficial effects to wilderness character and quality through the reduced potential for large and severe wildfires and associated impacts from fire-suppression activities.	Same as Alternative 2 plus Alternative 3 would have beneficial impacts to the untrammeled and undeveloped qualities of wilderness character due to no mechanical treatments. Impacts to the natural quality would be adverse, moderate, localized, and short- to long-term due to increased potential for locally severe fire effects on natural and cultural resource wilderness values.
Soundscapes	Alternative 1 would result in short-term, minor to moderate, localized, and adverse impacts to the soundscape due to noise from fire suppression activities, including noise from helicopters and vehicle use.	Same as Alternative 1 for wildfire suppression plus Alternative 2 would result in minor, short-term, site-specific adverse impacts to natural soundscapes due to noise from wildfire managed for resource objectives and prescribed burning, including preparation as well as minor to moderate, short-term, site-specific adverse impacts due to mechanical vegetation treatments. Over time there would likely be less soundscape impact over larger areas than Alternative 1 as there would likely be decreased intense fire control work by firefighters, as they would take better advantage of pre-prepared wilderness firelines, weather changes, and natural barriers, when possible to eventually control wildfires, thus less fire suppression efforts.	Same as Alternative 2 plus Alternative 3 would result in short-term, minor to moderate, localized, and adverse to the soundscape due to potential for larger and more intense wildfires in the Wilderness would increase fire suppression efforts and associated noises. This would likely shift some of the mechanical work to potential firelines outside the Wilderness, such as the Main Park Road, and increase the mechanical work (and noise) in that corridor and could reduce enjoyment of visitor experience in the Wilderness and non-wilderness visitors on the Main Park Road area.
Archaeological and Historic Resources	Alternative 1 would result in long-term, minor to moderate, adverse, and localized impacts due to potential fuel build up and the increased risk for severe wildfires. With avoidance of known archeological and historic resources and implementation of mitigation actions, the direct and indirect adverse impacts of fire suppression tactics would be localized, short-term, and minor.	Same as Alternative 1 for wildfire suppression plus Alternative 2 would result in direct, minor to moderate, beneficial, long-term, and localized impacts due to minimizing the potential for future severe wildfires as the amount of acres restored and defensible space increases and brush density decreases.	Same as Alternative 2 plus Alternative 3 would result in adverse, minor, long-term, site-specific and localized in and adjacent to the Wilderness due to increased potential risk of damages to archaeological and historic resources from more intense wildfires. Risks would increase compared to Alternative 2.
Cultural Landscapes	Alternative 1 would result in direct and indirect, short- to long-term, minor to moderate, adverse, localized due to continued retention and increased density of hazardous fuels within and adjacent to cultural landscapes and the increased risk for severe wildfires. The intensity of impacts would depend on the intensity, duration, and location of the fire, and the mitigation efforts that could be implemented.	Same as Alternative 1 for wildfire suppression plus Alternative 2 would result in direct, minor to moderate, beneficial, long-term, and localized impacts due to minimizing the potential for future severe wildfires as the amount of acres restored and defensible space increases and brush density decreases.	Same as Alternative 2 plus Alternative would result in adverse, minor, long-term, site-specific and localized impacts due to increased potential for more intense and larger wildfires, which could increase the potential risk of damage by severe wildfires to cultural landscapes and associated historic resources adjacent to the Wilderness.
Visitor Use and Experience	Alternative 1 would result in direct, short- to long-term, minor to moderate, adverse, and localized impacts due to potential increased fuel build up and risk for severe wildfires. This could require more frequent public use restrictions while fires are being suppressed and smoke generated by those fires would negatively impact the experience of visitors.	Same as Alternative 1 for wildfire suppression plus Alternative 2 would result in adverse, short-term, negligible to minor, localized impacts due to temporary displacement of some visitor activities during prescribed burn operations, smoke in scenic views, odors, temporary restrictions in access to some areas, and the presence of blacked areas within natural areas. Overall, this alternative would have direct, short-term negligible adverse impacts in the immediate area of treatment during the treatment period and is expected to have direct, minor to moderate, beneficial, long-term, localized impacts by minimizing the potential for future severe wildfires as the amount of area restored increases and fuel hazard reduction increases.	Same as Alternative 2 plus Alternative 3 would result in adverse, negligible to minor, short- to long-term, localized impacts to the Wilderness due to potential fuel build up, the potential for more intense and larger wildfires would be higher and could require more frequent public use restrictions while fires are being suppressed within and adjacent to the Wilderness.
Park Operations	Alternative 1 would result in short-term, minor to major, adverse impacts to park operations because of the increased probability of higher and more	Alternative 2 would result in short-term, minor to moderate and adverse impacts to park operations due to the fact that over time, the fuels treatment work outlined in	Same as Alternative 2 plus

Resource Topic	Alternative 1 No Action	Alternative 2 Preferred Alternative	Alternative 3 No Mechanical in Wilderness
	intense wildfires.	Alternative 2 should result in smaller and less intense wildfires. Long-term adverse effects on park operations would be negligible to minor in intensity, resulting from implementation of more active vegetation management tools because over time, park area closures would be less in number and length of time, benefiting visitors, residents, and employees.	Alternative 3 would have increased fire suppression efforts within the Wilderness, resulting in the same impacts as described in Alternative 1.
Human Health and Safety	Alternative 1 would result in direct, minor to moderate, long-term, adverse, localized impacts to firefighters, adjacent landowners, and the public through future severe wildfires from probable hazardous fuel buildup.	Same as Alternative 1 in regards to direct effects of fire suppression plus Alternative 2 would result in direct, minor to moderate, beneficial, long-term, localized impacts by minimizing the potential for future severe wildfires as the amount of acres restored successfully increases and acres of dense brush and ground cover (hazardous fuels) decreases. The impacts to health and safety because of vegetation management actions would be short-term, negligible to minor, adverse, localized with minimal human health and safety concerns for fire fighters and the public.	Same as Alternative 2 plus Alternative 3 would result in adverse, minor to major, short- to long-term, localized impacts to human health and safety due to no mechanical treatments in the Wilderness. The lack of fuel breaks would hinder prescribed and wildfire managed for resource objectives, likely leading to higher and more intense wildfires that would be harder to manage/suppress within the Wilderness than Alternative 2.

3.0 ENVIRONMENTAL CONSEQUENCES

3.1 Methodology

The effects of each alternative are assessed for direct, indirect, and cumulative effects for each resource topic selected. Actions are first analyzed for their direct and indirect effects. Direct effects are impacts that are caused by the alternatives at the same time and in the same place as the action. Indirect effects are impacts caused by the alternatives that occur later in time or are farther in distance than the action. Potential impacts are described in terms of type, context, duration, and intensity. Specific impact thresholds are given for each resource at the beginning of each resource section. General definitions for potential impacts are described as follows:

Type: Describes the impact as beneficial or adverse, direct or indirect:

Beneficial: A positive change in the condition or appearance of the resource or a change that moves the resource toward a desired condition.

Adverse: A change that moves the resource away from a desired condition or detracts from its appearance or condition.

Direct: An effect that is caused by an action and occurs in the same time and place.

Indirect: An effect that is caused by an action but is later in time or farther removed in distance, but is still reasonably foreseeable.

Context: Describes the location or area where the impacts will occur.

Site-specific: Impacts would occur within the location of the Proposed Action.

Local: Impacts would affect areas within the location of the Proposed Action and land adjacent to the Proposed Action.

Regional: Impacts would affect areas within the location of the Proposed Action, land adjacent to the Proposed Action, and land in surrounding communities.

Duration: Unless otherwise specified in this document, the following terms are used to define duration.

Short-term: impacts that generally last for the duration of the project. Some impact topics will have different short-term duration measures and these will be listed with the resource.

Long-term: Impacts that generally last beyond the duration of the project. Some impact topics will have different long-term duration measures and these will be listed with the resource.

Intensity: Describes the degree, level, or strength of an impact. The impacts can be *negligible, minor, moderate*, or *major*. Definitions of intensity can vary by resource topic and are provided separately for each impact topic analyzed.

3.2 Cumulative Impacts

The Council on Environmental Quality (CEQ) regulations, which guide the implementation the National Environmental Policy Act of 1969 (42 USC 4321 et seq.), require assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR 1508.7). Cumulative impacts are considered for all Alternatives.

Cumulative impacts were determined by combining the impacts of the alternative with other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other ongoing or reasonably foreseeable future projects in the Seashore and, if applicable, the surrounding region. The temporal scope includes projects within a range of approximately 10 years. Past, current, and foreseeable actions that could potentially contribute to cumulative effects in the Wilderness are noted below. No other past, current, or foreseeable actions that could contribute to cumulative effects.

- The addition of North End Tours as mandated by the 2004 CUIS Wilderness boundary adjustment legislation and initiated in August 2011. Tours operate on roads adjacent to Wilderness.
- The removal of structures associated with former reserved properties that were/are located in the Wilderness. One such property expired in 2011, and at least one other will expire in the foreseeable future.

3.3 Natural Resources

3.3.1 Air Quality

The Clean Air Act of 1963 (42 U.S.C. 7401 *et seq.*) established federal programs that provide special protection for air resources and air quality related values associated with NPS units. Specifically, Section 118 of the Clean Air Act requires a park unit to meet all federal, state, and local air pollution standards. The Seashore is designated as a Class II air quality area under the Clean Air Act, which means emissions of particulate matter and sulfur dioxide are allowed up to the maximum increase in concentrations of pollutants over baseline concentrations as specified in Section 163 of the Clean Air Act. In addition, the Clean Air Act gives the federal land manager the responsibility to protect air quality related values (i.e., visibility, plants, animals, soils, water quality, cultural resources, and visitor health) from adverse pollution impacts.

3.3.1.1 Affected Environment

National Ambient Air Quality Standards (NAAQS) for criteria pollutants are intended to protect human health and welfare. Criterion pollutants are sulfur dioxide (SO_2), nitrogen oxide (NO_x), ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$), lead (Pb), and carbon monoxide (CO).
The Seashore is classified as a Class II area under the 1977 amendments to the Clean Air Act. Class II areas are allowed modest increases in air pollution beyond baseline levels for particulate matter,

sulfur dioxide, nitrogen and nitrogen dioxide, provided that the national ambient air quality standards, established by the Environmental Protection Agency (EPA), are not exceeded.

Ambient monitoring for SO_2, NO_x, O_3, and PM has not been routinely conducted for the Seashore, but modeling efforts and estimates generated by NPS and based on regional air quality sites indicate that the Seashore is in compliance with the NAAQS (NPS 2009a). Most of the impacts to Seashore air quality do not come from Seashore activities, but nearby industrial paper mills.

Prior to any prescribed fire, the Seashore would notify the Georgia Forestry Commission, Camden County Dispatch Center, US Coast Guard, and, US Naval Base, at a minimum. The notification would identify the location and size of the proposed prescribed fire, as well as the fuel types to be burned.

3.3.1.2 Methodology and Intensity Threshold

Air quality impacts were qualitatively assessed using literature reviews and professional judgment based on consideration of fuel levels and types, size of area that could burn, and knowledge of air chemistry. The thresholds of change for the intensity and duration of an impact are defined as follows:

Intensity:

Negligible: The effects of the actions would have no changes or changes in air quality would be below or at the level of detection, and if detected would have effects that would be considered slight and short-term.

Minor: The effects of the actions would be measurable small, short-term, localized changes in air quality. Alteration to air quality would be temporary and limited smoke exposure to sensitive resources. No mitigation measures would be necessary.

Moderate: The effects of the actions would be measurable, localized changes in air quality that would have consequences, but air quality standards would still be met. Alteration to air quality resources would be short-term smoke exposure to sensitive resources. Mitigation measures would be necessary and would likely be successful.

Major: The effects of the actions would be measurable, regional changes in air quality that would have substantial consequences, and would violate state and federal air quality standards and Class II air quality standards. Alteration to air quality resources would be long-term smoke exposure to sensitive resources. Extensive mitigation measures would be needed to offset any adverse effects and their success could not be guaranteed.

Duration:

Short-term: Recovers in 7 days or less.
Long-term: Takes more than 7 days to recover.

3.3.1.3 Analysis of Alternatives and Impacts on Air Quality

Impacts of Alternative 1: No Action Alternative

There would be no direct impacts to air quality beyond the range of other alternatives. Indirect impacts would be from the continued increase in hazardous fuel loadings and increased potential for more intense wildfires that would be more difficult to suppress/manage. Wildfires in areas where no vegetation management has occurred tend to burn much larger acreages and more intensely than under a vegetation management prescribed fire scenario. Such wildfires are not planned around other weather events or meteorological conditions that would allow for dispersion and transport away from sensitive receptors (i.e., naval submarine base, private residents, Inter-coastal Waterway). These large, difficult to control wildfire incidents could have more smoke in volume than wildfires where the vegetation has been managed for fire adaption and fuel reduction. Wildfire occurrence without previous fuel reduction activities is likely to have greater particulate matter emissions and impacts to visibility than would be generated by prescribed fire. The No Action Alternative could result in adverse, minor to moderate, localized, long-term impacts due to increased potential for locally severe fire effects on air quality.

The lack of prescribed burning, managing wildfire for resource objectives, targeted herbicide application, use of manual and mechanical tools as well as continued responses to unplanned ignitions would reduce the number of vegetated acres restored successfully, continuing the retention and buildup of hazardous fuels in areas immediately adjacent to residences or NPS infrastructure and dense brush understory and ground cover. This would increase the potential for uncharacteristic wildfires that would be more difficult to control, thus increasing smoke and visibility impacts.

Cumulative Impacts

Activities that could contribute to air quality impacts include routine maintenance of park roads, wildfires, pile burns, forestry product plants in Florida and Georgia, and Interstate 95. These activities could result in minor to moderate, adverse impacts on the regional airshed.

The No Action Alternative in combination with the past, present, and foreseeable future actions would result in minor to moderate, short-term, adverse, localized cumulative impacts to air quality. Contribution to cumulative air quality impacts resulting from the No Action Alternative would be negligible, as most air quality impacts are from other sources.

Conclusion

The No Action Alternative would result in indirect, short-term, localized, and negligible to minor adverse impacts from potential wildfires to air quality. Cumulative effects under this alternative would be adverse, minor to moderate, short-term, and localized.

Impacts to Alternative 2: Preferred Alternative

Impacts to air quality from particulate matter and smoke produced from prescribed burns would be direct, adverse, minor, short-term, and localized. Fugitive dust generated from suppression activities and increased vehicle traffic associated with fire crews would temporarily affect air quality. Smoke, particulate matter, and dust emissions would impact visibility in the Seashore and surrounding area.

There may be an intermittent and short-term exceedance of air quality standards (especially particulates) resulting in short-term, localized, and negligible to minor adverse impacts to air quality and visibility. Mitigation measures would include burning during appropriate weather and fuel moisture conditions where fuels available to fire will burn out quickly. Burning under appropriate conditions can take advantage of favorable air column lift and transport conditions.

Indirect adverse effects from these air emissions would include reduced visibility along Seashore roadways, reductions in recreation values due to visibility limitations, smoke and odors, and possible health effects to sensitive receptors, such as residents and visitors. These adverse indirect effects would be short-term, localized, and minor. The amount and duration of these smoke impacts should be minimized by limiting the acres burned at one time and timing ignitions early in the day to allow for more complete combustion during daytime conditions.

A decrease in fuel loading following implementation of prescribed burning would result in indirect, long-term, and beneficial effects. Therefore, there would be a decrease in particulate matter emissions and the impairment of visibility from wildfires when they occur. These beneficial indirect effects would be long-term, local, and moderate.

Each prescribed fire plan will describe acceptable winds, identify smoke-sensitive areas and receptors when known, and include techniques and strategies to mitigate smoke impacts as much as possible. Fire weather forecasts would be used to correlate ignitions with periods of optimal combustion and smoke dispersal. Mitigation measures would be defined in the plan and arrangements made prior to ignition to ensure that designated resources are available if needed to implement the mitigation measures. Prescribed fire would not be implemented when atmospheric conditions exist that could permit degradation of air quality to a degree that negatively affects public health (federal and state air quality standards will be the basis for this decision). Significant smoke situations that arise and threaten smoke-sensitive areas may trigger suppression and/or mitigation measures that terminate the prescribed burn.

Air pollutants would be generated by use of internal combustion powered equipment in mechanical fuel reduction projects. The direct adverse effect of these pollutants on air quality, given the small size of the projects and infrequency of activity, would be localized, short-term, and negligible to minor. The indirect and longer-term adverse impacts would be negligible.

Impacts of managing wildfires for resource objectives would depend on the fire location, size, spread, resource values at risk, and other factors. Management of wildfires for resource objectives or partially managed for resource objectives would require appropriate control actions. These may include keeping the fire out of heavy fuels if it would produce too much smoke, keeping it away from sensitive natural or cultural resources, keeping it from burning private property, or suppressing one flank of the fire while allowing another to continue to burn under certain conditions, etc. This type of management reduces hazardous fuels and would likely result in less intense wildfires that are easier to manage/suppress with lower smoke emissions and visibility impacts. The use of wildfire to benefit resources would allow an appropriate management response to wildfires to accomplish specific resource management objectives in predefined areas outlined in the FMP.

Targeted herbicide application, such as foliar application, could result in herbicide temporarily in the air in the immediate vicinity of the work due to spray drift and volatilization (evaporation of liquid to

gas). However, mitigation measures (Section 2.6) and only using as a follow-up treatment to fuel breaks created and/or maintained by mechanical methods would reduce the potential for drift into non-target areas, and the amount of herbicide released into the air through volatilization. Airborne herbicide risks have been shown to be insignificant, even when prescribed fires are applied immediately after herbicide application (McMahon and Bush 1991). The indirect and longer-term adverse impacts would be negligible.

The Preferred Alternative could potentially produce slightly lower smoke emissions from effectively reducing brush understory and ground cover, changing the main fuel load to grass and forbs in some areas, a faster burning fuel, which creates less smoke. Overall, Alternative 2 would likely lead to lower and less intense wildfire emissions, which would have a beneficial local effect.

Cumulative Impacts

Activities that could contribute to air quality impacts include routine maintenance of park roads, wildfires, pile burns, forestry product plants in Florida and Georgia, and Interstate 95. These activities could result in minor to moderate, adverse impacts on the regional airshed.

The Preferred Alternative in combination with the past, present, and foreseeable future actions would result in minor to moderate, short-term, adverse, localized cumulative impacts to air quality. Contribution to cumulative air quality impacts resulting from the Preferred Alternative would be negligible, as most air quality impacts are from other sources.

Conclusion

Impacts from prescribed burns to air quality would result in direct, short-term, localized, and negligible to minor adverse. Impacts from wildfires managed for resource benefits would vary depending on the specific vegetation area/fire adapted habitat that may be burned, its recent fire and fuel treatment history, the eventual size of the wildfire incident, etc. Impacts would likely be beneficial, short- to long-term, moderate impacts. Contribution to cumulative air quality impacts under this alternative would be negligible, short-term, adverse, and localized.

Impacts to Alternative 3: No Mechanical Treatments in Wilderness

Air quality impacts under this alternative would be the same as Alternative 2; however, no mechanical treatments would occur in the Wilderness. This would make reduction of hazardous fuels less effective in the Wilderness (approximately 20,500 acres). The lack of Wilderness fuel breaks would hinder prescribed and wildland fire managed for resource objectives, likely leading to larger and more intense wildfire emissions within and adjacent to the Wilderness than Alternative 2. This would result in indirect, short-to long-term, localized, and minor to moderate, adverse impacts.

Cumulative Impacts

Activities that could contribute to air quality impacts include routine maintenance of park roads, wildfires, pile burns, forestry product plants in Florida and Georgia, and Interstate 95. These activities could result in minor to moderate, adverse impacts on the regional airshed.

Alternative 3 in combination with the past, present, and foreseeable future actions would result in minor to moderate, short-term, adverse, localized cumulative impacts to air quality. Contribution to cumulative air quality impacts resulting from Alternative 3 would be negligible, as most air quality impacts are from other sources.

Conclusion

Impacts from prescribed burns to air quality would result in direct, short-term, localized, and negligible to minor adverse. Impacts from wildfires to air quality would result in indirect, short-to long-term, localized, and minor to moderate, adverse. Contribution to cumulative effects under this alternative would be negligible, short-term, adverse, and localized.

3.3.2. Soil Resources

3.3.2.1 Affected Environment

There are nine soil-mapping units within the Seashore, including water and beaches (USDA Natural Resource Conservation Service 2013). Most of the soils were derived from homogenous quartz sands deposited during the island's formation. These soils are highly resistant to weathering and closely resemble their parent materials. Some characteristics of these island soils are low water-retention capacity, rapid permeability, and vulnerability to leaching and low pH. Rapid leaching leads to soils that cannot retain essential plant nutrients. Therefore, nutrients must be retained by plants or briskly recycled. Barrier island soils are especially vulnerable to disturbances and plant litter plays a major role in reducing nutrient leaching by dissipating the force of rainfall. Removal of plant litter or plant biomass results in rapid exhaustion and leaching of soil nutrients. Disruption of stabilizing vegetation permits wind erosion that is difficult to reverse. As sands begin to shift, a loss of productivity results in erosion to adjacent areas as well as where sand deposits bury stable soils and vegetation. However, burning also makes nutrients that are tied up in litter or plant biomass available in the soil for new growth and plant synthesis.

In general, the soils are mostly sand with Pleistocene soils underlying the core of the island, and newer deposits forming dunes on the east side and salt water marshes on the west side of the island. Pleistocene soils can be broken into three drainage classes—xeric (dry), mesic (moist), and wetland. Albany fine sand, Cainhoy fine sand, and Pottsburg sand underlie the driest, most xeric sites. Xeric sands (approximately 4,400 acres) are found on flat to slightly rolling topography on bluffs overlooking the Intracoastal Waterway and on elevated north-south ridges in the center of the island. Moist upland sites classified as Mandarin fine sand total 5,239 acres and make up large portions of the island. Rutledge fine sand is found in the wetland areas (approximately 1,320 acres). The dunes, marshes, and Little Cumberland Island are composed of Holocene soils totaling 15,589 acres (USDA Natural Resource Conservation Service 2013).

3.3.2.2 Methodology and Intensity Threshold

To analyze the impacts on geologic and soil resources, all available information on geological and soil resources in the Seashore was compiled, and developed in consultation with NPS staff and other sources. The thresholds of change for the intensity and duration of an impact are defined as follows:

*Negligible***:** The effects of the actions would not be discernible alteration to soils. Alteration to soil resources would be so slight that their ability to sustain biota, water quality, and hydrology would not be affected, and reclamation would not be necessary.

Minor: The effects of the actions would be localized or limited alteration to soils. Alteration to soils would affect their ability to sustain biota, water quality, and hydrology, such that reclamation would be achievable within 2 years. Mitigation measures, if needed to offset adverse effects, would be simple and successful.

Moderate: Alteration to soil resources would affect their ability to sustain biota, water quality, and hydrology, such that reclamation would be achievable within 3 to 5 years. Mitigation measures, if needed to offset adverse effects, could be extensive but would likely be successful.

Major: Alteration to soil resources would have a lasting effect on the ability of the geology and soil to sustain biota, water quality, and hydrology, such that reclamation could not successfully be achieved. Extensive mitigation measures would be needed to offset any adverse effects and their success could not be guaranteed.

Duration:

Short-term: Recovers in less than 3 years.
Long-term: Recovers in more than 3 years.

3.3.2.3 Analysis of Alternatives and Impacts on Soils Resources

Impacts of Alternative 1: No Action Alternative

Wildfire suppression tactics as the lone vegetation management agent have the potential to cause increased soil erosion. Lack of pre-fire actions and/or ineffective suppression tactics can lead to larger wildfires with higher intensity and soil affecting results. Minimum impact suppression tactics (e.g., select procedures, tools, and equipment that least impacts the environment, use water diversion devices on firelines to reduce erosion risk, re-contour area) would be used to reduce the suppression action impacts, but since the fires might be larger, they would have a larger total amount of suppression action (i.e., firelines) than the other alternatives. Thus, impacts to the soil from wildfire suppression tactics would be direct, short-term negligible to minor, adverse, and localized.

Under this alternative, the Seashore fire management program would be limited to wildfire suppression actions utilizing the appropriate response for conditions. The inability to utilize prescribed burning, managing wildfire for resource objectives, targeted herbicide application, and use of mechanical tools would reduce the number of vegetated acres restored successfully and defensible space and fuel breaks created/maintained. The No Action Alternative likely will lead to continued buildup of vegetative fuels, which could lead to larger and more intense wildfires that are difficult to suppress/manage. The resulting fire could be of high enough intensity to consume/remove the litter/duff layer from the soil surface as well as most standing vegetation. Removal of the vegetated living ground cover and/or the duff/litter layer would increase the potential for erosion or long-term soil changes to occur. Restoration and regrowth of ground cover would depend on the severity and size of the intensely burned area in the fire. If any steep areas were burned intensely, they would be prone to washing and erosion. The indirect impacts due to increased

potential for locally severe fire effects on soil, including physical alteration of soil structure and development of hydrophobic layers would be adverse, minor to moderate, localized, and long-term. Overall soil impacts would be negligible to moderate depending on the timing, location, severity and extent of the wildfire.

Cumulative Impacts

The No Action Alternative would result in minor, short- to long-term, adverse, localized cumulative disturbance to soils. Impacts to soil resources resulting from the No Action Alternative would be minor, as soil impacts would be distributed throughout the park, rather than being concentrated in one area or at one time, thus minimizing the adverse cumulative effects.

Conclusion

The No Action Alternative would result in short- to long-term, localized, minor to moderate, and adverse impacts from associated fire management activities and potential wildfires to soils. Cumulative effects under this alternative would be minor, short-term, adverse, and localized.

Impacts to Alternative 2: Preferred Alternative

Soil impacts for wildfires under this alternative would be the same as the No Action Alternative; however, wildfires managed under this alternative, over time, would likely be less intense over larger areas with soil fire effects within the range of naturally occurring wildfires. Additional vegetation management tools would be utilized including prescribed burns, managing wildfire for resource objectives, mechanical and manual treatments, and targeted herbicide application. The approved activities utilized under this alternative would have the indirect effect of lessening the intensity and size of wildfires in the long-term. The use of these additional vegetation treatment tools would reduce the timeframe needed to decrease brush understory and hazardous fuels vegetation in treated landscape units, thus reducing intensity and potential erosion impacts. In addition, being able to more successfully and efficiently create and/or maintain defensible space by reducing dense brush and ground cover, a significant fuel hazard within the Seashore, reduces the potential for an uncharacteristic wildfire.

Prescribed fire and wildfires managed for resource objectives would be beneficial by releasing nutrients into the soil and the fertilization effects of ash would provide an important source of nutrients for surviving and regrowth vegetation in a fire area. In addition to recycling nutrients back into the soils, raising pH, and increasing minerals and salt concentrations in the soil, the ash and charcoal residue resulting from incomplete combustion aids in soil buildup and soil enrichment by being added as organic matter to the soil profile. The added material works in combination with dead and dying root systems to make the soil more porous, better able to retain water, and less compact while increasing needed sites and surface areas for essential microorganisms, mycorrhiza, and roots (Vogl 1979, Wright and Bailey 1982).

The loss of some vegetative cover from prescribed fire or wildfires managed for resource objectives could lead to a potential increase of wind soil erosion. However, problems with wind erosion would only result in minor, adverse, localized, and short-term impacts. In addition, impacts following a

prescribed fire or wildfire managed for resource objectives would be reduced and/or eliminated during the "green-up" as new herbaceous cover developed.

If a prescribed fire or wildfires managed for resource objectives exceeded a burn prescription and burned "hot", resulting in areas of high-burn severity, the organic layer of the soil could be consumed and soil layers could become water repellant. Fire management personnel would contain and/or suppress out-of-prescription fires, minimizing the potential for, and effects of, any high-burn severity prescribed fires.

During the beginning period when the Seashore initiates managing fires for resource objectives, the NPS plans to be conservative in implementing this updated Seashore policy. That is because the Seashore Wilderness has decades of built up hazardous fuels from fire suppression that could burn more intensely than desired for ecological maintenance and restoration. Thus, the NPS plans to implement during carefully monitored conditions to maximize results, while protecting remaining stands of natural vegetation. Prescribed burns would also be utilized in select Wilderness areas to help return fuels and vegetation to conditions that approach natural fuel loads. The purpose of this policy change is to prevent fire impacts from being as severe as in an uncontrolled wildfire situation. Overtime, there would be a long-term ecological benefit to soil resources by the return of fire as a natural ecological process and reduced hazardous fuels resulting in lower and less intense wildfires easier to suppress/manage and fewer suppression impacts to soils.

Mechanical and manual equipment used during hazardous fuel reduction treatments (e.g., defensible space, fuel breaks) could impact soils in small, localized areas due to increased erosion by removing vegetation, or compaction of soils. Since this work would be on or adjacent to existing roads and trails, the physical changes to soils are not expected to be significant. However, implementing appropriate mitigation measures (See Section 2.6), minimizing use of mechanical to only when necessary, would minimize soil disturbance and not allow potentially erosive actions in areas identified by field resource specialists as containing highly erodible soils.

Targeted herbicide application, such as hand application, could result in herbicide migration into the soil. However, the NPS plans to use herbicides that do not have short or long-term residual implications to soil, water, or humans. The mitigation measures (Section 2.6), limited use as follow-up treatment to fuel breaks created by mechanical treatments, and low volume /low acreage application of herbicide to specific basal or foliar plant areas, would also help minimize chances for overspray and migration into the soil. The indirect and longer-term adverse impacts would be negligible.

Cumulative Impacts

The Preferred Alternative would result in minor, short-term, adverse, localized cumulative disturbance to soils. Contribution to soil resource impacts resulting from the Preferred Alternative would be minor, as soil impacts would be distributed to small areas throughout the Seashore, rather than being concentrated in one large area or at all one time, thus minimizing the adverse cumulative effects. Cumulative beneficial impacts to soils would also be minor and long-term. Use of prescribed burns and wildfires managed for resource objectives would also have long-term, localized, beneficial cumulative impacts to soils from increased nutrients.

Conclusion

The Preferred Alternative soil impacts would result in short-term, localized, minor, and adverse from prescribed burns and managed fires and associated activities. Beneficial long-term impacts to soils would result from the increased nutrients from prescribed burns and wildfires managed for resource objectives, increased stability of the soil strata, given increased ground cover to more grassy conditions, and the reduced threat of uncharacteristic wildfire. Cumulative effects under this alternative would be minor, short-term, adverse, and localized.

Impacts to Alternative 3: No Mechanical Treatments in Wilderness

Soil impacts under this alternative would be the same as Alternative 2; however, no mechanical treatments would occur in the Wilderness. This would make reduction of hazardous fuels more problematic and less effective in the Wilderness. The lack of Wilderness fuel breaks would hinder prescribed and wildfire managed for resource benefits, likely leading to higher and more intense wildfires harder to manage/suppress within the Wilderness than Alternative 2. The indirect impacts due to increased potential for locally severe fire effects on soil in the Wilderness would be adverse, negligible to moderate, localized, and short- to long-term.

Cumulative Impacts

Alternative 3, No mechanical in Wilderness, would have the same impacts as Alternative 2, except that soils in the Wilderness could have increased soil impacts. Overall, impacts to soils would be short-term localized minor, and adverse from prescribed or wildfires managed for resource objectives and associated activities.

Conclusion

Alternative 3 would result in minor, short-term, adverse, localized cumulative disturbance to soils. Contribution to soil resource impacts resulting from this alternative would be minor, as potential increased soil impacts would be distributed throughout the Wilderness, rather than being concentrated in one large area or all at one time, thus minimizing the adverse cumulative effects. Cumulative beneficial impacts to soils would also be minor and long-term. Use of prescribed burns and managed wildfires would also have long-term, localized, beneficial cumulative impacts to soils from increased nutrients.

3.3.3 Vegetation

3.3.3.1 Affected Environment

The Seashore has more diversity of plant communities than any other Georgia coastal island with beach and dune systems on the east side to salt marsh habitat on the west side. Vegetation is critical in maintaining stability on a dynamic barrier island. Extensive root systems of maritime grasses and herbaceous plants help to stabilize sediments, whether windblown or waterborne. The grasses themselves trap windblown sand. In this way, sand dunes build naturally and the topography is elevated just enough so that other plant life can take root. Shrubs and trees shield other vegetation

from the harsh salt-spray allowing different plant life to grow. Therefore, the vegetation forms distinctive ecological zones across the island.

Twenty-two plant communities have been described and mapped by Hillestad (1975) and thirty-four vegetation classes described by Frost (2011). Of the twenty-two plant communities, there are six general community types—salt marsh, dunes, interdune flats, fresh water, upland forests, and manmade. Upland forest communities make up approximately 39% of the Seashore with oak-pine and oak-palmetto as the dominant communities (Hillestad 1975). Mature forests are dominated by broadleaf evergreen species. Important tree species include live oak (*Quercus virginiana*), laurel oak (*Quercus laurifolia*), several species of pine (*Pinus* spp.), and bayberry (*Myrica cerifera*). Common understory plants include saw palmetto (*Serenoa repens*), bristly panic grass (*Panicum aciculare*), other grasses, and many vine species.

Vegetation within the Seashore is closely related to soil type, past land use, and fire history. Dry soils on Cumberland Island support vegetation in various stages of succession from open pine stands to mixed oak and pine, to xeric oak hammock. Large hardwoods, particularly live oak, turkey oak (*Q. laevis*), laurel oak, and water oak (*Q. nigra*) have grown on many of these sites. Remnant slash pine (*Pinus elliottii*) and longleaf pine (*P. palustris*) still occur in their historic natural densities among the large oaks. Loblolly pine (*P. taeda*) grows in higher densities where it was planted and on old field sites. Where soil has not been disturbed by agricultural tilling, understory species including piney woods dropseed (*Sporobolus junceus*), wiregrass (*Aristida stricta*), buckthorn (*Bumelia tenax*), waveyleaf noseburn (*Tragia urens*), pitted stripeseed (*Piriqueta caroliniana*), longleaf pawpaw (*Asimina longifolia*), and needlegrass species (*Stipa* spp.) are scattered.

Mesic upland sites are dominated by either oak scrub or live oak hammock, depending on fire history. Oak scrub grows on an expansive area of Mandarin fine sand on the north end of the island with a smaller area in Table Point. Similar soils on the narrow south end of the island, where there have not been large wildfires, are vegetated by mesic hammock. Both scrub and hammock vegetation types contain live oak, sand live oak (*Q. geminata*), myrtle oak (*Q. myrtifolia*), slash pine, pond pine (*P. serotina*), lyonia (*Lyonia spp.*) saw palmetto, red bay (*Persea borbonia*), tarflower (*Befaria racemosa*), and blueberry species (*Vaccinium* spp.). Where hammock vegetation is well developed, epiphytic Spanish moss (*Tillandsia usneoides*) and polyphony fern grow on the branches of oaks reaching three and four feet in diameter. The Seashore's scrub is very similar to the scrub and scrubby flatwoods vegetation found on Florida's central ridges and panhandle (Davison 1984).

Saltwater marshes flank the western edge of the island and are dominated by saltmarsh cordgrass (*Spartina alterniflora*). Small islands or keys may also be found in these areas, some of which are remnants of dredging spoils where small plant and brush communities have developed. These upland areas are called back barrier islands or marsh hammocks

Dunes run the length of the east side of the island and are dominated by wax myrtle (*Myrica cerifera*), saltmarsh cordgrass, sedges (*Carex* spp.), sea oats (*Uniola paniculata*), and cabbage palm (*Sabal palmetto*).

Invasive, Non-native Species

There are 66 non-native species known to occur in the Seashore with 39 of these recognized as invasive by the Georgia Exotic Pest Plant Council (GAEPPC; Hunt and Langeland 2005, Zomlefer

et al. 2008). Of the 39 invasive species, 9 are ranked as serious invasive and 9 are ranked as moderate invasive (Zomlefer et al. 2008). The rankings were done by the GAEPPC (2013) with input from professionals and land managers. Terrestrial invasive plant species found in the Seashore include, but are not limited to Chinese tallow (*Triadica sebifera*), tree of heaven (*Ailanthus altissima*), tung oil tree (*Vernicia fordii*), Bermuda grass (*Cynodon dactylon*), bamboo (*Phyllostachys* and *Bambusa* spp.), salt cedar (*Tamarix* spp.), Chinese tallow (*Sapium sebiferum*), and common mullein (*Verbascum thapsus*). Aquatic plant species listed include alligatorweed (*Alternanthera philoxeroides*) and giant reed (*Arundo donax*; Zomlefer et al. 2008).

3.3.3.2 Methodology and Intensity Threshold

The methodology used for assessing vegetation impacts included using available spatial data and literature to identify the plant communities present and identifying the potential effects to plant populations (e.g., composition, diversity, abundance) by the action alternatives. The thresholds of change for the intensity of an impact are defined as follows:

Negligible: The action alternatives would not affect native vegetation or some individual native plants would be affected, but there would be no effect on native plant species' populations (e.g., composition, diversity, abundance). The effects would be on a small scale.

Minor: The effects of the actions would affect some individual plants and a relatively limited portion of that species' population would also be affected. Mitigation measures, if needed to offset adverse effects, would be simple and successful. Reclamation is readily achievable through natural successional processes.

Moderate: The effects of the actions would affect some individual native plants and a sizeable segment of the species' population would also be affected over a relatively wide area. Mitigation measures, if needed to offset adverse effects, could be extensive, but would likely be successful. Reclamation is achievable but likely requires additional resources to accomplish goals.

Major: The effects of the actions would cause substantial alteration to individual native plants and affect a sizeable segment of the species' populations over a relatively wide area. Extensive mitigation measures would be needed to offset any adverse effects, and their success would not be guaranteed. Reclamation may not be attainable even with substantial efforts.

Duration:

Short: Recovers in 3 years or less.
Long: Recovers in more than 3 years.

3.3.3.3 Analysis of Alternatives and Impacts on Vegetation

Impacts of Alternative 1: No Action Alternative

Under this alternative, the Seashore fire management program would be limited to wildfire suppression and management options allowed under National Fire Policy. The inability to use prescribed fire, wildfire managed for resource objectives, mechanical and manual fuel reduction

work, and the inability to utilize herbicides to slow brush return after fuel reduction work would greatly reduce ecological restoration and defensible space actions. This would allow the retention and continued buildup of hazardous fuels. Continued fire exclusion would hinder restoration and maintenance of fire-adapted systems and other unique vegetation areas. This would increase the potential for uncharacteristic wildfires that would be more difficult to control. Indirect effects to vegetation could be adverse, minor to major, localized, and long-term due to increased potential for locally severe fire effects on vegetation, including physical alteration of vegetation structure, composition, and function and increased susceptibility to spread of invasive plants. This would also result in reduced resilience of the Seashore ecosystems to continued stress from hurricanes, drought, pest outbreaks, and wildfire.

High intensity wildfires could cause soil sterilization, remove soil organic matter, lower the soil pH and nitrogen content, kill rhizomes and mycorrhiza, or cause soil to repel water, and result in short and long-term changes in vegetation communities. However, MIST would be used to minimize impact of fire control actions to soils, thus minimizing potential adverse impacts to vegetation.

Brackish water bucket drops may be used to suppress fires at the Seashore, allowing infiltration of brackish water into groundwater through the soil. Existing saltwater sources for vegetation includes precipitation, as airborne salts (chloride and sodium), which may increase salts to soils, shallow surface waters, and ground water by evapotranspiration and evaporation; and sea-spray accumulation, tides, and storm surges in low-lying areas (Barlow 2003). Vegetation and soils in this area are exposed to naturally occurring ambient levels of salt (e.g., precipitation, salt spray). The plants are presumed to have adapted to higher salt levels and should not exhibit the expected signs of salt impact, which would be uprooting, bleaching, loss of vigor, and mortality. Thus, brackish water helicopter bucket drops made during suppression operations at the Seashore should have no adverse impacts on vegetation because bucket drops would not occur in the same location continuously and naturally occurring salt present in the soils. Because the ocean is usually too rough for safe dipping by helicopters, helicopter dipping at the Seashore in the past has been from the brackish or fresh river waters. The salt concentration in adjacent river waters varies with the dipping location, tide level, river flows, season etc. and is thought to vary widely. Direct adverse effects of saltwater buckets used to suppress wildfires would be adverse localized, short-term, and negligible to minor to vegetation.

Potential spread of invasive plants could occur from equipment used by fire crews on wildfire suppression efforts (i.e., carried in on equipment from outside the area, fireline construction equipment). Soil disturbance from fireline construction could lead to increased soil erosion and potential increase for noxious weeds. Following fire management suppression activities areas would be monitored and invasive vegetation may be removed by manual or mechanical treatments. Impacts from the spread of invasive weed species would be long-term and adverse if viable seeds are transported and become established. However, due to mitigation measures that would be used (i.e., cleaning of equipment before and after use, firelines re-contoured and covered with cut vegetation after suppression activities), impacts would be negligible.

Climate Change

Recent analysis on fire extent and climate during the past 35 years revealed an increase in frequency of large, high severity fires since the mid-1980s with longer wildfire duration and longer wildfire seasons (Westerling et al. 2006). It is likely that vegetation types that have experienced fuel

accumulations and increased vegetation density are more sensitive to climatic variability (i.e., less resilient to fires during drought and warmer years). However based on the current information available for climate change and associated vegetation changes and the fact that interactions between climate change, fire, and vegetation are complex and uncertain, it is unknown whether the same or different vegetation would grow back following a large, severe fire. However, if repetitive fires occur following a large, severe wildfire, it is thought unlikely that historic vegetation associations can develop as they did in the past.

In addition, there are potential future changes in plant communities from predicted climate change, as individual plant species respond to large and small-scale changes in temperature and precipitation, fertilizing effect of increased carbon dioxide, and changing patterns of inter-specific competition (Shafer et al. 2001). The spread of non-native plant species could be accelerated in response to future climate changes, particularly in those areas where native plant species are unable to adapt to the climate changes (DeVivo et al. 2008). Annual average temperature patterns have shown large fluctuations over the past century with no discernible trend; precipitation and rising sea levels are also not predictable (NPS 2007). Many future scenarios have been developed and modeled in an attempt to quantify future climate change (Solomon et al. 2007, USFS 2013). Annual temperatures predicted for Camden County are predicted to increase from 1.4 to 2.7 degrees Celsius by 2050 compared to the year 2000 (USFS 2013). Precipitation is predicted for driest models to decrease by 8.7 millimeters and to increase by 10.5 millimeters in the wettest projections by 2050 compared to the year 2000 (USFS 2013). However, at this time, the models are not sufficiently precise to address increases in temperature and water stress over the short duration of the planning period and the small scale of the project area. Many national studies indicate sea level rise and temperature rise are inevitable; it is just the quantitative numbers that model differently.

Considered over a broad scale, areas treated with prescribed fire can remove additional environmental stressors and competition on species and allow them to better adapt to climate change. Burn plan prescriptions and real-time fire modeling rely on current meteorological conditions and fuel characteristics, which reflect the uneven progression of longer-term changes. These planning and decision-making processes are an example of short-term adaptive management followed by the fire program under guidance in RM-18, Wildland Fire Management. As additional scientific information becomes available at a useful temporal, spatial, and/or ecological scale, it would also contribute to the longer-term adaptive management process through annual program reviews and revisions to the Fire Management Plan. Due to increased fuels and potential for larger and more intense fire behavior indirect effects would be adverse, minor to moderate, short- to long-term, and localized.

Cumulative Impacts

The No Action Alternative would have minor to moderate, long-term, adverse, and localized impacts from future severe wildfires due to continued retention and increase of fuel buildup of dense brush understory and ground cover.

Conclusion

Impacts to vegetation from limiting the fire management program to wildfire suppression could be minor to major, long-term, adverse, and localized due to future severe wildfires from potential fuel

buildup. There would be indirect, adverse, minor to moderate, short- to long-term localized impacts due to increased fuels and potential for larger and more intense fire behavior.

Impacts to Alternative 2: Preferred Alternative

Vegetation impacts under this alternative would be the same as the No Action Alternative with respect to wildfire suppression; however, prescribed burns, managing wildfire for resource objectives, mechanical and manual treatments, and targeted herbicide application would be used. Both prescribed fire and wildfires managed for resource benefits would benefit the native plant communities by: rejuvenating the soils with nutrients; reducing dense trees and brush; increasing the vigor of native plants thus reducing competition from invasive plants; increasing flower production and/or seed germination of fire-adapted plant species; and restoring the native vegetation structure, composition, and function of historically fire-maintained vegetation associations. Wetland and riparian plant communities have evolved with the periodic fire regime; some require it to maintain the open vegetation communities with sparse overstories and abundant herbaceous cover. Wetland plant species possess adaptations to fluvial disturbances that facilitate survival and reestablishment following fires, thus contributing to the rapid recovery of many wetland vegetation communities.

The use of prescribed fire or wildfire managed for resource objectives could result in the loss of individuals and communities of plants in the short-term. However, both would have direct, minor to moderate, beneficial, long-term, localized impacts by restoring the native vegetation structure, composition, diversity, and function of historically fire-maintained vegetation associations.

Mechanical and manual treatments would include removal of undesirable vegetation near buildings and structures (i.e., WUI areas) to create/maintain defensible space, roadside or trail mowing or mastication to reduce the potential for vehicle-caused fires along park roads, and to make them more viable as wildfire control lines. Some similar fuels reduction in wilderness would occur on a limited scale to maintain and/or create fuel breaks along strategically located existing trails and roads; they would then be used for holding on prescribed fires or for limiting the size and duration of wildfires during the restoration phase of allowing fire back into the Seashore fire adapted ecosystems. Potential spread of invasive plants could occur from equipment used by fire crews both on prescribed fire and wildfires managed for resource benefits work (i.e., carried in on equipment from outside the area, mechanical fuel reduction treatment equipment, fireline construction equipment). Following fire management activities (e.g., prescribed burns, hazardous fuels reduction), areas that were treated would be monitored and invasive vegetation may be removed by manual or mechanical treatments. Impacts from the spread of invasive weed species would be long-term and adverse if viable seeds are transported and become established. However, due to mitigation measures that would be used (i.e., cleaning of equipment before and after use, avoid burning when possible in areas at high risk for weed establishment or spread), impacts would be negligible.

Targeted herbicide application, only used in masticated areas, would minimize chances for overspray and applying to non-target plants. Thus, mitigation measures (Section 2.6), limited use, and application of herbicide to specific basal or foliar plant areas, would minimize chances for overspray and impacting non-target plants. The indirect and longer-term adverse impacts would be negligible.

Climate Change

Considered over a broad scale, areas treated with prescribed fire and wildfires managed for resource objectives can remove additional environmental stressors on species and allow them to better adapt to climate change. Burn plan prescriptions and real-time fire modeling rely on current meteorological conditions and fuel characteristics, which reflect the uneven progression of longer-term changes. These planning and decision-making processes are an example of short-term adaptive management followed by the fire program under guidance in RM-18, Wildland Fire Management. As additional scientific information becomes available at a useful temporal, spatial, and/or ecological scale, it would also contribute to the longer-term adaptive management process through annual program reviews and revisions to the Fire Management Plan. Due to reduced fuels and fire behavior potential in treated areas indirect effects would be beneficial, long-term, and localized.

Cumulative Impacts

Cumulative impacts to vegetation from the Preferred Alternative in combination with the past, present, and foreseeable future actions would be direct, moderate, long-term, beneficial, and localized. This would be due to the decreased dense brush understory and ground cover, thus improving ecological restoration and the return of a natural fire regime and an increased trend of resilience to future climate warming or droughts.

Conclusion

The Preferred Alternative would result in direct, minor, adverse, short-term, and localized impacts from prescribed burns and wildfires managed for resource objectives and associated activities. Cumulative effects to vegetation under this alternative would be direct, moderate, long-term, beneficial, and localized.

Impacts to Alternative 3: No Mechanical Treatments in Wilderness

Vegetation impacts under this alternative would be the same as Alternative 2; however, no mechanical treatments would occur in the Wilderness. This would make reduction of hazardous fuels less effective in the Wilderness. The lack of fuel breaks in the Wilderness would hinder prescribed and wildfire managed for resource objectives, likely leading to larger and more intense wildfires harder to manage/suppress within the Wilderness than Alternative 2. No mechanical treatments in the Wilderness would hinder restoration and maintenance of fire-adapted systems and other unique vegetation areas. Indirect effects to vegetation would be adverse, minor to moderate, localized, and long-term due to increased potential for locally severe fire effects on vegetation, including physical alteration of vegetation structure, composition, and function and increased susceptibility to spread of invasive plants. This could also result in reduced resilience and integrity of vegetation values in the Wilderness.

Cumulative Impacts

Alternative 3, No mechanical in Wilderness, would have the same impacts as Alternative 2, except that vegetation communities in the Wilderness could have increased adverse impacts. Over the entire Seashore, the impacts to vegetation would be direct, moderate, long-term, beneficial, and localized.

Conclusion

Indirect effects to vegetation would be adverse, minor to moderate, localized, and long-term due to increased potential for locally severe fire effects on vegetation in the Wilderness. Over the entire Seashore, impacts to vegetation would be direct, moderate, long-term, beneficial, and localized.

3.3.4 Wildlife/Wildlife Habitat

3.3.4.1 Affected Environment

The abundant and diverse vegetation in the Seashore supports marine and terrestrial habitat for a variety of fish and wildlife species. The aquatic habitat is more extensive and diverse than other barrier islands in Georgia. The Seashore provides nesting, foraging, breeding, and roosting areas important to wading and shorebirds, essential habitat for otters, amphibians, and reptiles, and breeding and rearing habitat for many large vertebrates. The Seashore provides marine, intertidal, upland, and freshwater habitats for plant and animal species (Alber et al. 2005).

There are approximately 30 species of mammals, 300 bird species, 55 species of reptiles and amphibians, and 85 fish species (NPS 2013a). Many studies of specific types of wildlife, such as inventories of mammals, birds, amphibians, reptiles, and insects have been performed in the Seashore. Some of the most thorough inventories were conducted by Hillestad et al. (1975) shortly after the Seashore's establishment in 1972.

Mammals
The Seashore supports more species of large vertebrates than any of Georgia's other barrier islands. These include the white-tailed deer (*Odocoileus virginianus*), gray squirrels (*Sciurus carolinensis*), raccoons (*Procyon lotor*), bobcat (*Lynx rufus*), otter (*Lontra canadensis*), and opossum (*Didelphis virginiana*). Nonnative species present in the Seashore include feral pigs (*Sus scrofa*), feral horses (*Equus caballus*), coyotes (*Canis latrans*), armadillo (*Dasypus novemcinctus*), and black rats (*Rattus rattus*). American black bear (*Ursus americanus*), southeastern pocket gopher, and eastern fox squirrel are extirpated from the Seashore. There have been 31 mammal species documented in the Seashore (NPS 2013a).

Birds
Birds are the most visible and diverse vertebrate fauna found in the Seashore. Currently, there are 323 documented bird species (NPS 2013a). The undeveloped beach provides important habitat for winter migratory shore- and wading birds. The 2013 mid-winter shorebird survey recorded over 28,000 birds and 20 species. The beach and associated dunes provide suitable nesting habitat in the spring/summer months for shorebirds which include but are not limited to American Oystercatcher (*Haematopus palliatus*), Least Terns (*Sternula antillarum*), Wilson's Plovers (*Charadrius wilsonia*), and Willets (*Tringa semipalmata*). The marshes provide nesting habitat for Clapper Rails (*Rallus longirostris*) and Marsh Wrens (*Cistothorus palustris*); year-round foraging habitat for shore and wading birds and raptors, including the Bald Eagle (*Haliaeetus leucocephalus*). The mature oak forests provide nesting habitat for 77 species of tree nesting birds and foraging habitat for over 100 species of insect-eating birds. Three active Bald Eagle nests have been recorded annually in the Seashore.

The Seashore lies in the Atlantic migration flyway, and many species of birds are transient during spring and fall migrations. Migration flyways provide habitats to serve as food sources, water sources, and resting places for migrating birds. Birds found in the Seashore predominantly consist of four categories: waterfowl, shorebirds, passerines (including many Neotropical songbirds), and raptors. The abundance and variety of birds in the Seashore contribute to one of the favorite visitor activities, bird watching.

Reptiles and Amphibians

There have been 57 species of reptiles and amphibians documented in the Seashore with 40 of these being reptiles (NPS 2013a). Five of the world's six sea turtle species either migrate through or nest on the Seashore's beaches annually. The loggerhead sea turtle (*Caretta caretta*) is the primary nesting species on Georgia's coast. Leatherback (*Dermochelys coriacea*) and green sea turtles (*Chelonia mydas*) nest on the Seashore and the Georgia coast annually, but in minimal numbers.

Fish

Currently 89 species are known to inhabit the Seashore waters (NPS 2013a). Species of commercially valuable fish are supported by the food chain of the Seashore's salt marshes and tidal creeks. The small fish species use the *Spartina* dominated marshes for nursery and foraging habitat moving in and out with the tides. Fishing is a popular recreational activity at and adjacent to the Seashore.

3.3.4.2 Methodology and Intensity Threshold

The methodology used for assessing wildlife impacts included using available literature to identify the wildlife species and habitat communities present and identifying the potential effects to wildlife populations (e.g., composition, diversity, abundance) by the action alternatives. The thresholds of change for the intensity of an impact are defined as follows:

Negligible: No wildlife species would be affected or some individuals could be affected as a result of the alternative, but there would be no effect on wildlife species' populations. Impacts would be well within natural fluctuations.

Minor: Some wildlife species would be affected and a limited part of the species' population would be affected as a result of the alternative. Mitigation measures, if needed, would be simple and successful.

Moderate: Some wildlife species would be affected and a sizeable part of the species' population would be affected as a result of the alternative over a relatively large area within the Seashore. Mitigation measures, if needed, would be extensive and successful.

Major: A considerable effect on wildlife individuals and on a sizeable segment of the species' population as a result of the alternative over a relatively large area in and outside the seashore. Extensive mitigation measures would be needed to offset any adverse effects and may not be successful.

Duration:

Short: If individual species or habitat recovers in ≤ 3 years.
Long: If individual species or habitat recovers in >3 years.

3.3.4.3 Analysis of Alternatives and Impacts on Wildlife

Impacts of Alternative 1: No Action Alternative

Under this alternative, the fire management program would be restricted to wildfire suppression activities. The inability to use more active vegetation management tools could reduce the success of ecological restoration efforts, thus reducing the number of acres successfully restored to fire-adapted habitats, and hindering restoration and maintenance of other unique vegetation areas that are being taken over by dense brush species or small trees. Without sufficient ecological restoration in these areas, brush species would continue to increase in density and abundance, changing species composition and the structure of native vegetation, thus leading to a more homogenous habitat state and reducing wildlife habitat quality and increasing the potential for uncharacteristic wildfires, (such as larger than average or high-intensity, stand replacing fire over large areas). In addition, without successful ecological restoration (i.e., prescribed fire and wildfire managed for resource objectives to mimic natural fire cycles), fire dependent vegetation may decrease in prevalence and vigor, with negative effects on wildlife species long adapted to those vegetation types. This could also lead to a buildup of brush density, increasing hazardous fuel loads, which could lead to more intense wildfires that are difficult to suppress/manage. Impacts on wildlife habitat and individuals due to increased potential for locally or widespread severe fire effects would be indirect, adverse, minor to moderate, localized, and long-term.

Wildfire suppression tactics would temporarily disturb wildlife species near the burn area from an increase in noise disturbance from equipment, vegetation cutting, human presence, smoke, fire, and soil disturbance. The use of helicopters for transport of personnel and firefighting actions would result in additional disturbances to wildlife. In addition, reproduction and survival for individuals may be affected due to increased stress and loss of foraging opportunities. Temporary displacement and habitat loss may occur for some individuals within the burn area. Mortality to wildlife species that are smaller and less mobile such as, small mammals, lizards, and snakes, may also occur from wildfires, while some larger animals may not be able to move out of the fire path in time, becoming disoriented by the fire.

Aquatic species in the Seashore should not be affected by fireline construction or fire retardant aviation use since mitigation measures state that no chemical retardant or foam would be utilized within 300 feet of standing streams or surface waters. Impacts to fisheries from wildfires could include changes in water chemistry, soils, water temperature and vegetation associated with water resources. Indirect effects could include changes in fish and amphibian species composition, habitat dynamics, accumulation of woody debris, water yield, hydrologic processes, erosion patterns, and nutrient cycling. These changes may result in either beneficial or adverse impacts, depending on species impacts and factors related to fire severity, season, location, vegetation type, and magnitude of burns. Increased sediment yield and water temperatures would tend to be short-term, unless a fire was of extreme severity. Increases in runoff and nutrient flux could continue for several years after large, intense fires. Large or severe wildfires could create negative impacts on fisheries if they

caused changes in water quality at a time when the fishery was most vulnerable (e.g., spawning, rearing in nursery habitat).

Cumulative Impacts

The No Action Alternative would result in minor, short- to long-term, adverse, localized impacts due to displacement and habitat alteration from wildfires. Potential impacts to wildlife habitat are minor to moderate, long-term, adverse, and localized through future severe wildfires from potential fuel buildup in areas and reduced acreage of sufficient ecological restoration, leading to continued brush species increasing in density and abundance. This would result in the likelihood of more intense and larger wildfires over time.

Conclusion

The No Action Alternative cumulative impacts would be direct, minor, adverse, short-term, and localized. Impacts to wildlife habitat from limiting the fire program to wildfire suppression activities could also have minor to moderate, short- to long-term, adverse, and localized effects due to future severe wildfires from potential fuel buildup in areas and reduced habitat quality. Cumulative effects to wildlife resources under this alternative would be minor to moderate, short to long-term, adverse, and localized.

Impacts to Alternative 2: Preferred Alternative

Wildlife impacts under this alternative would be the same related to wildfire suppression as the No Action Alternative, except that the likelihood of intense or larger wildfires would decrease with time as prescribed burns, wildfires managed for resource objectives, and completed vegetation management actions were completed.

The use of more active vegetation management tools would increase the success rate of restoring fire as a process, thus increasing fire dependent vegetation in prevalence and vigor, and thus have a positive impact on wildlife species historically present at the Seashore and adapted to those vegetation types. In addition, the ability to reduce more dense brush areas would potentially increase wildlife habitat quality and ground forage available. It would increase the potential for lower intensity ground fires, which are easier to manage/suppress and have less impact on wildlife and their habitat. Thus, the Preferred Alternative would have minor to moderate, beneficial, long-term, localized impacts by restoring the variety and diversity of vegetation communities and wildlife habitat present and minimizing the potential for future severe wildfires.

Prescribed fire and managing wildfires for resource objectives could benefit individual wildlife species and their habitat by emulating the natural fire regime and creating a more historic and natural vegetation pattern across the Seashore (creating localized, but not widespread areas of early succession vegetation), enhancing the variety and diversity of vegetation communities and wildlife habitat present. Both prescribed burns and wildfires managed for resource objectives would provide more nutrients to the soils in the short-term, which would increase new plant growth and improve the amount of ground and grass species available, and the nutritional quality of this forage for wildlife species. The burned areas generally green up earlier than non-burned areas, thus providing earlier grazing (Redmon and Bidwell 2003).

Prescribed fires could directly impact nesting resident and migratory birds if conducted during breeding season (generally between March–August) through mortality of fledglings that are unable to flee or avoid the burn units. Performing prescribed burns when possible outside the breeding season and/or avoiding main nesting areas, such as rookeries, should mitigate these potential impacts.

Impacts on wildlife species that are less mobile from mechanical and manual treatments used for hazardous fuel reduction would be short-term, adverse, and localized due to stress and disturbance. Potential mitigations include avoiding seasons when ground nesting birds are actively nesting. Short-term impacts on more mobile wildlife species would be temporary displacement from the treatment areas.

Targeted herbicide application, such as foliar application to specific basal or foliar plant areas, would minimize chances for overspray and applying to non-target plants. Thus, mitigation measures (Section 2.6), limited use, low volume application of herbicide to specific basal or foliar plant areas, and following all labels would minimize chances for overspray and impacting non-target plants. In addition, herbicides commonly used for vegetation management by the NPS (e.g., triclopyr (Garlon 4/Element 4), glyphosate, imazapyr, sulfometuron, metsulfuron methyl, hexazinone) have been designed to target biochemical processes unique to plants, thus have low levels of direct toxicity or risk to wildlife and fish when used in accordance with label specifications (Tatum 2004). Herbicides commonly used for vegetation management also degrade quickly upon entering the environment and thus are neither persistent nor bioaccumulate (Tatum 2004). Over time, using targeted herbicide as a follow-up treatment to reduce and/or maintain brush regrowth along fuel breaks would reduce and/or cease the need for repetitive mechanical work, thus minimizing reoccurring disturbances to wildlife.

Habitat for aquatic species would have the appropriate streamside management zones (SMZ) placed on either side to assure that there would be essentially no opportunity for spray, directly or in drift, to enter those waters (Georgia Forestry Commission 2009). SMZs are based on stream type and slope class present. Federal FIFRA regulations and federal agency water quality monitoring have indicated that use of herbicides in forestry vegetation management constitute low risk to humans and wildlife (Shepard et al. 2004). Overall, limited herbicide applications applied at low volumes would have a negligible effect on wildlife because of the low concentrations applied. The indirect and longer-term adverse impacts would be negligible.

Cumulative Impacts

Impacts to wildlife resources from the Preferred Alternative would be minor, short-term, adverse, localized and minor, long-term, beneficial, and localized due to improved habitat from the return of a natural fire regime.

Conclusion

Not implementing the active vegetation management activities listed in this alternative would result in larger and more intense wildfires that would have a high probability of destroying nesting, breeding, and foraging habitat in significant ways and for a longer term. This type of fire would have a deleterious effect on most wildlife species historically found at the Seashore, although a few species that take advantage of severely burned habitat would benefit. Thus the Preferred Alternative

would result in minor to moderate, beneficial, long-term, localized impacts restoring the variety and diversity of vegetation communities and wildlife habitat present at the Seashore and minimizing the potential for future severe wildfires. Cumulative effects under this alternative would be minor, long-term, beneficial, and localized due to increased forage for wildlife species and an increased array of mosaic type habitats with a decrease in the potential for catastrophic wildfires.

Impacts to Alternative 3: No Mechanical Treatments in Wilderness

Wildlife impacts under this alternative would be the same as Alternative 2; however, no mechanical treatments would occur in the Wilderness areas. This would make reduction of hazardous fuels less effective in the Wilderness. The lack of Wilderness fuel breaks would hinder prescribed and wildfire managed for resource objectives, likely leading to higher and more intense wildfires harder to manage/suppress within the Wilderness than Alternative 2. No mechanical treatments in the wilderness areas would hinder restoration and maintenance of fire-adapted systems and other unique vegetation areas, potentially decreasing wildlife habitat quality and composition and distribution of wildlife species. Indirect effects to wildlife habitat would be adverse, minor to moderate, localized, and long-term due to increased potential for locally severe fire effects on wildlife habitat, including physical alteration of vegetation structure and composition. The actual effects of no mechanical treatments on wildlife in the Wilderness would depend on the location, timing, extent and severity of future wildfires. There would be no adverse, short-term impacts to wildlife from mechanical treatments in the Wilderness.

Cumulative Impacts

Alternative 3, No mechanical in Wilderness, would have the same impacts as Alternative 2, except that wildlife species and their habitat in the Wilderness could have increased adverse impacts due to increased high intensity wildfires.

Conclusion

Indirect effects to wildlife and their habitat would be adverse, minor to moderate, localized, and long-term due to increased potential for locally severe fire effects. The actual effects of no mechanical treatments on wildlife in the Wilderness would depend on the location, timing, extent and severity of future wildfires.

3.3.5 Special Status Species

3.3.5.1 Affected Environment

Under the Endangered Species Act of 1973 (ESA), the NPS has the responsibility to address impacts to federally listed, candidate, and proposed species. The terms “threatened” and “endangered” describe the official federal status and certain species in the Preserve as defined by the Endangered Species Act. The term “candidate” is used officially by the U.S. Fish and Wildlife Service (USFWS) to describe species, which sufficient information exists on biological vulnerability and threats to support a “proposed rule to list,” but issuance of the proposed rule has not been done. NPS policies dictate that federal candidate species, proposed species, and state species of concern are to be

managed to the greatest extent possible as federal–listed endangered and threatened species (NPS 2006).

The Federal and State listed threatened, endangered, or candidate species, and species of special concern that may be potentially found in Camden County, Georgia, are discussed in this section. Table 6 provides a comprehensive list of those species, their habitat and potential known threats. Information on these species is from the U.S. Fish and Wildlife Service, National Marine Fisheries Service, and Georgia Department of Natural Resources. The list includes five mammals, nine birds, one fish, five reptiles, two amphibians, and seven plants. The only federally threatened species that might be directly impacted by the proposed fire management activities are the land-based and freshwater species: Piping plover, Red-cockaded woodpecker, Wood stork, Eastern Indigo snake, loggerhead sea turtle (land based because nests on beaches), and Gopher tortoise. There are no federally listed plant species known to occur within the Seashore.

There are 29 Georgia state-listed species with potential to occur in Camden County (Table 6). Ten of these species are federally protected under the ESA; the Bald eagle is protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. Of the 29 species, six state listed species and/or their habitat may be impacted by fire management activities on the Seashore: Bald eagle, climbing buckthorn, Florida wild privet, soapberry, velvet sedge, and greenfly orchid. The round-tailed muskrat, Rafinesque's big-eared bat, Southeastern pocket gopher, striped newt, gopher frog, pondspice, and Wagner spleenwort are known to occur within Camden County; however, based on their known ranges, these species do not occur and have not been documented on the Seashore (GA DNR 2013, NPS 2013a).

Table 6. State and Federally listed Species Known to Occur in Camden County, Georgia.

Species	Federal Status	State Status*	Habitat	Threats
Mammal				
Right whale (*Eubalaena glacialis*)	E	E	Mate and calve in shallow coastal waters; critical habitat designated from the mouth of Altamaha River south to Sebastian Inlet, FL (from shoreline east 5-15 nautical miles)	Initial decreases probably due to overharvesting. Slow population growth after exploitation halted may be due to collisions/disturbance associated with boats and barges, inbreeding, inherently low reproductive rates, or a reduction in population below a critical size for successful reproduction.
Round-tailed muskrat (*Neofiber alleni*)	—	T	Bogs and ponds; creates pyramid-shaped nest in vegetation	Habitat loss from human activities and natural succession. Loss of bog/floating mat vegetation-type habitat due to man's suppression of wildfires.
West Indian manatee (*Trichechus manatus*)	E	E	Coastal waters, estuaries, and warm water outfalls	Initial decreases probably due to overharvesting for meat, oil and leather. Current mortality due to collisions with boats and barges and from canal lock operations. Declines also related to coastal development and loss of suitable habitat, particularly destruction of sea grass beds.

Species	Federal Status	State Status*	Habitat	Threats
Rafinesque's big-eared bat (*Corynorhinus rafinesquii*)	—	R	Roosting sites in coastal plain bottomland areas, large, hollow cypress and gum trees with openings near the base.	Potential threats include pesticides and alteration of forested habitats, including removal of hollow cull trees.
Southeastern pocket gopher (*Geomys pinetis*)	—	R	Loose, sandy, well-drained soil for burrow construction and an abundant supply of grasses and forbs for food.	Habitat alteration and loss of longleaf pine/wiregrass communities.
Bird				
Piping plover (*Charadrius melodus*)	T	T	Winter on Georgia's coast; prefer areas with expansive sand or mudflats (foraging) in close proximity to a sand beach (roosting)	Habitat alteration and destruction and human disturbance in nesting colonies. Recreational and commercial development has contributed greatly to loss of breeding habitat.
Red-cockaded woodpecker (*Picoides borealis*)	E	E	Nest in mature pine with low understory vegetation (<1.5m); forage in pine and pine hardwood stands > 30 years of age, preferably > 10" dbh	Reduction of older age pine stands and encroachment of hardwood mid-story in older age pine stands due to fire suppression.
Wood stork (*Mycteria Americana*)	E	E	Primarily feed in fresh and brackish wetlands and nest in cypress or other wooded swamps. Active rookeries are located in Camden County.	Decline due primarily to loss of suitable feeding habitat, particularly in south Florida. Other factors include loss of nesting habitat, prolonged drought/flooding, raccoon predation on nests, and human disturbance of rookeries.
American Oystercatcher (*Haematopus palliates*)	—	R	Nests on marsh islands, upland dunes, beaches, and dredge spoils. Atlantic Coast population nests from Massachusetts to southern Florida.	Human disturbance, loss of nesting habitat to development, and predation are known threats to this species' success.
Bald eagle (*Haliaeetus leucocephalus*)	—	T	Inland waterways and estuarine areas in Georgia. Two active eagle nests were documented on Cumberland in 2008.	Major factor in initial decline was lowered reproductive success following use of DDT. Current threats include habitat destruction, disturbance at the nest, illegal shooting, electrocution, impact injuries, and lead poisoning.
Gull-billed tern (*Sterna nilotica*)	—	T	Nests in colonies on sandy sites; forages over salt marsh, dunes and other grassy areas for insects, spiders, and other invertebrates	Nest disturbance and loss of habitat to beach-front development are the major threats to this species.
Least Tern (*Sterna antillarum*)	—	R	Atlantic Coast breeding populations range from Massachusetts to	Human disturbance of nesting colonies is the primary threat to this species' success. Predation also is a concern.

Species	Federal Status	State Status*	Habitat	Threats
			Florida. Nesting colonies have been documented in all Georgia coastal counties.	
Swallow-tailed kite (*Elanoides forficatus*)	—	R	Nests in large pine trees within floodplain or riparian forest, or in older stands of pine forest adjacent to floodplains of large rivers or tributary creeks.	Loss of nesting, foraging, and roosting habitat from drainage of marshes and conversion of bottomland forests.
Wilson's Plover (*Charadrius wilsonia*)	—	T	Atlantic Coast breeding populations range from New Jersey to northern South America. Nesting habitat includes beaches, sand flats and spits.	Loss of nesting habitat from human development; predation from wild, feral, and domestic animals; and human disturbance in the form of pedestrians and vehicles are primary threats to this species.
Fish				
Shortnose sturgeon (*Acipenser brevirostrum*)	E	E	Atlantic seaboard rivers	Construction of dams and pollution, habitat alterations from discharges, dredging or disposal of material into rivers, and related development activities.
Reptiles				
Eastern Indigo snake (*Drymarchon corais couperi*)	T	T	During winter, den in xeric sand ridge habitat preferred by gopher tortoises; during warm months, forage in creek bottoms, upland forests, and agricultural fields	Habitat loss due to uses such as farming, construction, forestry, and pasture and to over collecting for the pet trade.
Gopher tortoise (*Gopherus polyphemus*)	C	T	Well-drained, sandy soils in forest and grassy areas; associated with pine over story, open understory with grass and forb groundcover, and sunny areas for nesting	Habitat loss and conversion to closed canopy forests. Other threats include mortality on highways and the collection of tortoises for pets.
Green sea turtle (*Chelonia mydas*)	T	T	Rarely nests in Georgia; migrates through Georgia's coastal waters	Exploitation for food, high levels of predation, loss of nesting habitat due to human encroachment, hatchling disorientation due to artificial lights on beaches, and drowning when trapped in fishing and shrimping nets.
Leatherback sea turtle (*Dermochelys coriacea*)	E	E	Rarely nests in Georgia; migrates through Georgia's coastal waters	Human exploitation, beach development, high predation on hatchlings, and drowning when caught in nets of commercial shrimp and fish trawls and long line and driftnet fisheries.

Species	Federal Status	State Status*	Habitat	Threats
Loggerhead sea turtle (*Caretta caretta*)	T	T	Nests on Georgia's barrier island beaches; forages in warm ocean waters and river mouth channels.	Loss of nesting beaches due to human encroachment, high natural predation, drowning when turtles trapped in fishing and shrimping trawls, and marine pollution.
Amphibians				
Striped Newt (*Notophthalmus perstriatus*)	—	T	Sandhills and well-drained pine flatwoods are typical adult habitats. Breeding and larvae habitat typically use isolated, ephemeral, wetlands. In Georgia, occur in the lower and middle Coastal Plain and at one site in the Upper Coastal Plain.	Loss of both upland and wetland habitats.
Gopher Frog (*Rana capito*)	—	R	Restricted to longleaf pine ecosystems; longleaf pine-saw palmetto-wiregrass sandhills and more poorly drained longleaf pine flatwoods.	Fire suppression or lack of burning during the growing season and habitat fragmentation.
Plants				
Climbing buckthorn (*Sageretia minutiflora*)	—	T	Calcareous rocky bluffs, forested shell middens on barrier islands, and evergreen hammocks along stream banks and coastal marshes. Recorded from 12 populations, 6 are on public lands.	Clearing and conversion of habitat to developments.
Pondspice (*Litsea aestivalis*)	—	R	Margins of swamps, cypress ponds, and sandhill depression ponds and in hardwood swamps. Recorded from 13 counties in Georgia.	Ditching, draining, and filling wetlands. Fire suppression and construction of firebreaks in wetland transition zones.
Wagner spleenwort (*Asplenium heteroresiliens*)	—	T	Marl outcrops, damp limestone ledges, and tabby masonry. Only 5 populations recorded.	Destruction and degradation of habitat by exotic invasive species, cave explorers, and developers.

Species	Federal Status	State Status*	Habitat	Threats
Florida wild privet (*Forestiera segregate*)	—	R	Coastal/maritime forests and shrub-scrub areas over shell mounds on or near barrier islands or bordering salt marshes. Seven populations are known; most on state or federal park lands or military bases.	Clearing and development in coastal habitats. Digging and destruction of shell mounds. Invasion by exotic pest plants.
Soapberry (*Sapindus marginatus***)**	—	R	Coastal shell mounds and hardwood hammocks, often near edges of salt marsh, with live oak, red cedar, red bay, pignut hickory, and yaupon. Five populations known; all on state and private lands.	Clearing and development of coastal hammocks.
Velvet sedge (*Carex dasycarpa*)	—	R	Well drained, sandy-loamy soils in a variety of habitats: mixed pine-hardwood forests on river bluffs and stream terraces, levees and swales in floodplains, maritime forests along Atlantic coast rivers, longleaf pine woodlands on barrier islands, beech-magnolia-spruce pine forests. 15 populations are currently known, most on conservation land.	Conversion of habitat to pine plantations, agriculture, and development. Invasion by exotic pest species such as Japanese honeysuckle and d Japanese climbing fern.
Greenfly Orchid (*Epidendrum magnolia*)		U	Limbs of southern magnolia and live oak trees in moist forests, usually along streams. Less frequently found in sandstone outcrops. 70 populations are currently known to occur in conservation areas.	Removal by orchid collectors, logging, and clearing in lowland forests.

* C = Candidate; E = Endangered; T = Threatened; SC = Species of Concern; R = Rare; U = Unusual
Sources: USFWS, last updated February 25, 2013; and Georgia DNR, last updated October 12, 2011.

Birds

Piping plover, federal and state threatened, nonbreeding migrants spend a considerable amount of time on the Seashore coast annually, with individuals normally arriving in late July and early August and remaining into mid-May. Currently, there are no piping plovers known to nest on the Seashore.

The Red–cockaded woodpecker, federal and state endangered, prefer open, park-like stands of mature pine maintained by frequent fire. No colonies are known to occur in the Seashore, but longleaf pine habitat suitable for colonization could be available if fire restoration is present.

The Wood stork, a federal and state endangered species, was known to roost in an area located to the north of the Plum Orchard mansion. The roost site is on the edge of a manmade pond that is part of the historic landscape. Wood storks also roosted (often at high tide) at the South End Ponds, in trees at Lake Whitney, Heron Pond, or along the St Marys River (Bratton 1988). They prefer cypress trees (or other tall wetland forest species) for nest sites, and it has been noted that the presence of alligators might be beneficial to the species as they help prevent nest predation by raccoons and other small mammals. Currently, no wood storks are known to nest on the Seashore, but have done so in the past at Heron Pond and suitable habitat could be available in the future, if fire restoration is present.

Bald eagle, a state threatened species, typically nest in large, open-topped pine trees near open water (Georgia DNR 2013). The Seashore has three active nests annually with two located in the Wilderness in areas of minimal human disturbance. Estimated distance of nests from roads or trails ranges from 300 to 400 feet.

Swallow-tailed kite, a state rare species, nests in large pines found in small "pine islands" within floodplain or riparian forest or in older stands of pine forest adjacent to floodplains of large rivers or tributary creeks (Georgia DNR 2013). Foraging habitat includes hardwood hammocks, pine flatwoods, pine forests bordering riparian areas, freshwater and brackish marshes, wet prairies, sloughs, and pastures (Georgia DNR 2013). The Swallowed-tailed kite is listed as a rare, resident within the Seashore (NPS 2013a). However, no active nests have been documented within the Seashore (personal communication Doug Hoffman Seashore wildlife biologist).

Reptiles

The Eastern indigo snake, federal and state threatened, is closely associated with longleaf pine habitats, such as sandhills and turkey oak scrub (Georgia DNR 2013). In winter months, gopher tortoise burrows and stumps are used as den sites. Historically, this snake was known to occur on the Georgia barrier islands, but is not likely to occur on any barrier island today (Georgia DNR 2013). To date no Eastern indigo snakes have been found in the Seashore, although favorable habitat exists in the Seashore—longleaf pine habitats, pine-scrub oak woodlands, and forested ridges.

The Gopher tortoise, a federal candidate and state endangered species, requires three key habitat components—sandy soil for burrowing, sunlight availability, and abundant herbaceous vegetation (Georgia DNR 2013). This tortoise is associated with longleaf pine/wiregrass communities, which include sandhills, dry flatwoods, and turkey oak scrub. In Georgia, this tortoise occurs in the southern half of the state, but is absent from Okefenokee Swamp and most barrier islands. Documented accounts from Cumberland Islands are thought to be from an introduced origin rather than

naturally occurring (Georgia DNR 2013). On the Seashore the known gopher tortoise range extends from Stafford Field and southward to the Dungeness area. Sightings of the gopher tortoise are uncommon.

The loggerhead sea turtle, a federal and state endangered species, is a regular summer visitor to the Seashore, nesting on or near the base of dunes fronting the beach. Over the last 13 years, the Seashore has documented an average of 294 sea turtle nests established per year. During the 2012 nesting season, 700 loggerhead sea turtle nests were documented.

Plants

Climbing Buckthorn, a state threatened species, is a deciduous shrub that occurs on limestone bluffs, forested shell mounds on barrier islands, and evergreen hammocks along stream banks and coastal barriers (Georgia DNR 2013). This species has been documented from six Georgia counties including Camden (Chafin 2007). Climbing buckthorn has been documented in pine-oak forests in the Seashore (Zomlefer et al. 2008) and is found mainly on or near the coast, but a few instances of inland presence have been documented.

Florida wild privet, a state rare species, is described as shrub or small tree and flowers from late-winter to early spring (Georgia DNR 2013). This privet inhabits coastal/maritime forests and shrub-scrub areas over shell mounds on or near barrier islands or bordering salt marshes (Georgia DNR 2013). This species has been documented from five Georgia counties (Chafin 2007). In the Seashore, this species was found in disturbed areas with an infrequent abundance—small number of individuals were encountered sporadically; species relatively scarce (Zomlefer et al. 2008).

Soapberry, a state rare species, is described as a small tree or large shrub and flowers from summer to early fall (Georgia DNR 2013). This species inhabits coastal shell mounds and hardwood hammocks, often near edges of salt marshes with live oak, red cedar, red bay, pignut hickory, and yaupon (Georgia DNR 2013). This species has been documented from four Georgia counties (Chafin 2007). This species is known to occur in maritime hammock and along marsh borders in the Seashore with few individuals encountered (Zomlefer et al. 2008).

Velvet Sedge, a state rare species, is a perennial grass-like herb and produces fruits from early spring to summer (Georgia DNR 2013). This species is typically found on well drained, sandy-loamy soils in a variety of habitats, including maritime forests along Atlantic coast rivers, longleaf pine woodlands on barrier islands, mixed pine-hardwood forests on river bluffs and stream terraces, and beech-magnolia-spruce pine forests (Georgia DNR 2013). In the Seashore, this species is known to occur in disturbed areas—pine plantations, fields, high foot-traffic areas—ranging from a common to infrequent abundance (Zomlefer et al. 2008).

Greenfly orchid, a state unusual species, is an epiphytic, perennial herb that is evergreen and embeds its roots in the bark of tree limbs or in rocks (Georgia DNR 2013). This species is typically found on limbs of southern magnolia and live oak trees or in sandstone outcrops consisting of Altamaha Grit (Georgia DNR 2013). In the Seashore, this species is known to occur in maritime hammocks with abundance rated as rare (very few individuals encountered; Zomlefer et al. 2008).

3.3.5.2 Methodology and Intensity Threshold

The methodology used for assessing special status impacts included using available GIS data and literature to identify the special status species and habitat communities present and identifying the potential effects to special status populations (e.g., composition, diversity, abundance) by the action alternatives. The thresholds of change for the intensity of an impact are defined as follows:

Negligible: No individuals of a special-status species would be affected but a very localized area of their habitats could be affected as a result of the alternative.

Minor: A few individuals of special status species or localized areas of their respective habitats would be affected, but the species' population would not be affected as a result of the alternative. Mitigation measures, if needed, would be simple and successful.

Moderate: A number of individuals of special status species populations or a limited portion of their respective habitats would be affected as a result of the alternative. The impacts would be difficult to detect using typical population monitoring techniques. Mitigation measures, if needed, would be extensive and successful. Moderate effect would equate with a "may affect, likely to adversely affect" or "not likely to adversely affect" determination in U.S. Fish and Wildlife Service terms and would require formal consultation.

Major: A measureable portion of a special-status population or a large portion of their respective habitats would be affected as a result of the alternative over a relatively large area within the park. The impacts would be readily detectable using typical population monitoring techniques. Extensive mitigation measures would be needed to offset any adverse effects and may not be successful.

Duration:

Short-term: If individual species or habitat recovers in $\leq$ 1 year; population recovers in $\leq$ 3 years.
Long-term: If individual species or habitat recovers in $\geq$ 1 year; population recovers in > 3 years.

3.3.5.3 Analysis of Alternatives and Impacts on Special Status Species

Impacts of Alternative 1: No Action Alternative

Under this alternative, the Seashore fire management program would be limited to wildfire suppression activities. There would be no new activities proposed that has the potential to change the current status of listed species known to inhabit or frequent the areas in and adjacent to the Seashore. Proposed actions under this alternative with potential to impact threatened and endangered species include: construction of firelines, fire retardant associated with suppression activities, noise from human presence and fire equipment. The inability to use more active vegetation management activities including prescribed burning, wildfire managed for resource objectives, mechanical and manual equipment use on vegetation, and targeted herbicide use would reduce the ability (i.e., reduced acreage) and efficiency to restore fire-adapted ecosystems; to create and/or maintain defensible space; and to restore fire as a natural ecological process to the landscape. This would result in the continued retention and increase of hazardous fuels in the Seashore as brush density continues to increase. This could lead to increased potential for larger and more severe wildfires that

are difficult to suppress/manage. Without sufficient ecological restoration in fire-adapted habitats and other unique habitats, brush species would continue to increase in density and abundance, potentially changing species composition and structure of native vegetation, thus leading to a more homogenous habitat state and reducing habitat quality and key habitat requirements needed to maintain viable populations of threatened and endangered species. As discussed in the wildlife section, increased human presence and noise related to fire suppression tactics could temporarily disturb species within the wildfire areas.

The inability to use more active fire management tools could reduce the number of acres successfully restored to longleaf pine systems, which are used by red-cockaded woodpeckers, gopher tortoises, and Eastern indigo snakes. Without sufficient ecological restoration in these areas, brush species would continue to increase in density and abundance, potentially reducing suitable nesting and foraging habitat (i.e., open grassy groundcover), thus habitat quality and increasing the potential for an uncharacteristic wildfire. Past studies have shown hardwood and woody shrub encroachment reduce foraging habitat quality (James et al. 1997, Walters et al. 2002). An uncharacteristic wildfire could kill a substantial portion of vegetation, including canopy trees and herbaceous layer, and sterilize the soil, further hindering the creation of habitat suitable for the red-cockaded woodpecker and gopher tortoise. Mortality to individual gopher tortoises could occur from a severe wildfire due to slow mobility. Impacts on red-cockaded woodpecker and gopher tortoise habitat due to potential destruction of nesting habitat and reduced suitable foraging habitat would be minor to moderate, long-term, adverse, and localized.

Wood storks use a variety of freshwater and estuarine wetlands for breeding, foraging, and roosting. The inability to use more active fire management tools could reduce the number of acres successfully restored to wetlands that are used by wood storks, thus, potentially reducing the amount of suitable habitat (i.e., open wetland vegetation) and the habitat quality. The impacts from a severe wildfire would be the same as described for the longleaf pine systems in terms of soils and removal of vegetation. Impacts on wood stork habitat due to potential destruction and/or degradation of roosting, nesting, and foraging habitat would be adverse, minor to moderate, short- to long-term, and localized.

There would be no direct impacts to beaches that are used by loggerhead sea turtles and piping plovers. Disturbance to these species from fire suppression activities and human presence could be indirect, adverse, short-term, localized impacts. The driving of vehicles and equipment on the beach would be coordinated with Resource Management staff and in accordance with regulations established by the Georgia Department of Natural Resources, to minimize disturbance of wildlife particularly during nesting periods for sea turtles and shorebirds.

Bald eagles typically nest in large pine trees adjacent to open water bodies, such as along the coast, major rivers, wetlands, and reservoirs. The impacts from a severe wildfire would be the same as described for the longleaf pine systems in terms of soils and removal of vegetation. Impacts on bald eagle habitat would be due to destruction and/or degradation of current and future hunting perches, roost sites, and nest sites along with altered aquatic prey habitat due to potential increased sedimentation to adjacent water bodies. Impacts to bald eagle habitat would be adverse, localized, minor to moderate, and short- to long-term.

Swallow-tailed kites nest in large pine trees within floodplains or riparian areas and forage primarily for insects in open areas. The impacts from a severe wildfire would be the same as described for the

longleaf pine systems in terms of soils and removal of vegetation. Impacts to swallow-tailed kite habitat would be due to destruction of potential nest and roost sites along with destruction of potential prey habitat—insects, lizards, snakes, frogs. Impacts to swallow-tailed kite nesting, roosting, and foraging habitat would be adverse, localized, minor to moderate, and short- to long-term.

The continued buildup of hazardous fuels could lead to increased potential for larger and more severe wildfires that are difficult to suppress/manage. The impacts from a sever wildfire could kill a substantial portion of herbaceous cover, sterilize the soil, remove soil organic matter, kill rhizomes and mycorrhiza, or cause soil to repel water, thus, further hindering the long-term objective of maintaining suitable habitat and viable populations of state listed plant species. Depending on the severity and extent of future wildfires, impacts could range from individual plants to populations. Impacts to state listed plant species and/or their habitat would be adverse, localized, minor to moderate, and short- to long-term.

The No Action alternative would have negligible impacts on piping plovers, red-cockaded woodpeckers, wood storks, swallow-tailed kites, Eastern indigo snake, and loggerhead sea turtles. Negligible impacts would occur because no red-cockaded woodpeckers or Eastern indigo snakes inhabit the Seashore, no wood storks or swallow-tailed kites are known to roost or nest in the Seashore, and no areas of the beach being used by piping plovers or loggerhead sea turtles would be used during wildfire suppression activities.

Cumulative Impacts

Cumulative impacts to special status species and their habitats from the No Action Alternative would result in minor to moderate, long-term, adverse, and localized due to increased potential for severe wildfires from continued retention and buildup of hazardous fuels.

Conclusion

Potential impacts on wood stork, gopher tortoise, bald eagle, and swallow-tailed kite habitat from uncharacteristic wildfires would be minor to moderate, long-term, adverse, and localized due to potential destruction of suitable habitat. Potential impacts on state listed individual plants or populations and their habitats from uncharacteristic wildfires would be minor to moderate, long-term, adverse, and localized.

Impacts to Alternative 2: Preferred Alternative

Special status species impacts under this alternative would be the same related to wildfire suppression as the No Action Alternative, except that the likelihood of intense or larger wildfires would decrease with time as prescribed burns, wildfires managed for resource objectives, and vegetation management actions were completed. The use of more active vegetation management tools would increase the success rate of restoring fire as a natural ecological process, thus increasing fire dependent vegetation in prevalence and vigor, having a positive impact on special status species adapted to those vegetation types. For example, a study conducted over 10 years showed herbicide and mechanical treatments in longleaf pine stands to result in higher survival rates, greater productivity, less woody understory cover, and larger trees (Haywood 2010). In addition, the ability to reduce more mid-story brush species would potentially increase habitat quality for special status species by opening the mid-story vegetation layer and promoting herbaceous ground cover available

as forage (e.g., forbs, grass, wildflowers), and increase the potential for lower intensity ground fires in the future, which are easier to manage/suppress. Thus, Alternative 2 would increase the amount of native fire-adapted vegetation and wildlife habitat over time.

Prescribed fire and wildfires managed for resource objectives would be used to restore and maintain open park-like stands of mature longleaf pine preferred by red-cockaded woodpeckers, gopher tortoises, and Eastern indigo snakes, and to restore open wetland habitats used by wood storks. Prescribed burns and wildfires managed for resource objectives have the ability to control hardwoods and shrubs while improving the herbaceous layer and soils (USFWS 2003). In addition, prescribed burns and wildfires managed for resource objectives as a restoration tool emulate historic fire regimes and aids in the reproduction, growth, and maintenance of longleaf, and other native habitats, creates openings, and aids in reestablishing highly diverse native groundcovers, all important factors of healthy and suitable wildlife habitat. Burn plans would include mitigation measures to minimize any potential impacts to special status species and their habitats.

Prescribed burns and wildfire managed for resource objectives would also help to restore and/or maintain wetland habitats used by multiple species, including wood storks. Wetland plant communities and velvet sedge have evolved with a periodic fire regime and require it to maintain the open vegetation communities with sparse overstories and abundant herbaceous cover. Wetland plant species possess adaptations to fluvial disturbances that facilitate survival and reestablishment following fires, thus contributing to the rapid recovery of many wetland vegetation communities. Fire also reduces large plant, brush, and tree species in the immediate areas of wetlands; these species could utilize and transpire significant volumes of fresh water. Post-fire research has shown that some fresh surface water sources recover and fill after fire events, which would be beneficial to Seashore freshwater wetland habitat. In addition, prescribed fires and wildfires managed for resource objectives could emulate the natural fire regime and are beneficial to wetlands by providing an influx of nutrients to the soil from the plant biomass burned, stimulates seed production, and helps to perpetuate the vegetation and wildlife species associated with wetlands (Craft and Casey 2000, Battle and Golladay 2001).

Prescribed burns and wildfire managed for resource objectives would have minor, short-term, adverse, localized impacts on individual bald eagles or swallowed-tailed kites due to disturbance and/or displacement within a burn unit area and potential destruction of hunting perches (e.g., dead snags). However, prescribed burn plans would include mitigation measures to minimize any potential impacts to these species and/or their habitat.

Targeted herbicide application—foliar treatments—to specific basal or foliar plant areas, would minimize chances for overspray and applying to non-target plants. Thus, mitigation measures (Section 2.6), limited use, low volume application of herbicide to specific basal or foliar plant areas, and following all labels would minimize chances for overspray and impacting non-target plants. In addition, areas with any known special status species—federal and state listed plants and animals—would be buffered from any mechanical work and follow-up targeted herbicide applications and would have minimal opportunity for herbicide spray, directly or in drift. Thus, the Preferred Alternative would result in negligible impacts from targeted herbicide application to wood storks due to the beneficial impacts with continuing prescribed burning and wildfires managed for resource objectives to foster restoration of wetland communities favored by this species.

There should be no potential for direct impacts to a transient piping plover traveling through the Seashore or loggerhead sea turtles because herbicides would not be used in the beach/dune habitats. Plus, herbicides commonly used for vegetation management (e.g., triclopyr (Garlon 4/Element 4), glyphosate, imazapyr, sulfometuron, metsulfuron methyl, hexazinone) have been designed to target biochemical processes unique to plants, thus have low levels of direct toxicity to animals and pose little risk to wildlife when used in accordance with the label specifications (Tatum 2004). The indirect and longer-term adverse impacts would be negligible. Neither direct nor indirect short-term or long-term effects of targeted herbicide treatments would be expected to red-cockaded woodpeckers, eastern indigo snake, or wood storks because the Seashore does not support any known populations or contain designated critical habitat.

All proposed actions would be of short duration, timed so as not to interfere with breeding and nesting seasons and designed to preserve identified species, sensitive habitats, and resources. By following mitigation measures impacts to listed species should be minor to moderate, long-term, beneficial, localized impacts from prescribed burns and wildfires managed for resource objectives and associated fireline activities.

Cumulative Impacts

The Preferred Alternative would result in minor to moderate, long-term, beneficial, localized cumulative impacts to special status species and their habitats through improved habitat from the return of a natural fire regime and increased ecological restoration success (i.e., removal of dense brush and ground cover).

Conclusion

Implementing prescribed burning and wildfires managed for resource objectives to foster restoration of longleaf pine and other native fire-adapted vegetation communities favored by the six federally-listed species—red-cockaded woodpecker, piping plover, wood stork, Eastern indigo snake, gopher tortoise, and loggerhead sea turtle—would have long-term, minor to moderate beneficial effects for these species or their habitat. The Preferred Alternative would result in minor to moderate, long-term, beneficial, localized cumulative impacts from prescribed burns and wildfires managed for resource objectives and associated fireline activities. Cumulative effects under this alternative would be moderate, long-term, beneficial, and localized impacts to special status species and/or their habitat. No formal consultation with U.S. Fish and Wildlife Service was deemed necessary to discuss impacts to protected species, however, this EA will be sent to the U.S. Fish and Wildlife Service for review and comment.

Impacts to Alternative 3: No Mechanical Treatments in Wilderness

Special status species impacts under this alternative would be the same as Alternative 2; however, no mechanical treatments would occur in the Wilderness. This would make reduction of hazardous fuels less effective in the Wilderness, hindering prescribed and wildfire managed for resource objectives. This would likely lead to larger and more intense wildfires, harder to manage/suppress within the Wilderness than Alternative 2. No mechanical treatments in the Wilderness would hinder restoration and maintenance of fire-adapted systems (e.g., longleaf pine habitat) and other unique vegetation areas, potentially decreasing habitat quality for special status species in the Wilderness. Indirect

effects to habitat would be adverse, minor to moderate, localized, and long-term due to increased potential for locally severe fire effects on habitat of special status species, including physical alteration of vegetation structure and composition and potential loss of individual or local populations of state listed plant species. The actual effects of no mechanical treatments on special status species or their habitat in the Wilderness would depend on the location, timing, extent and severity of future wildfires. There would be no disturbance to special status species from mechanical treatments, thus no short-term impacts compared to Alternative 2.

Cumulative Impacts

Alternative 3, No mechanical in Wilderness, would have the same impacts as Alternative 2, except that special status species and their habitat in the Wilderness could have increased adverse impacts due to increased high intensity wildfires.

Conclusion

Indirect effects to special status species and their habitat would be adverse, minor to moderate, localized, and long-term due to increased potential for locally severe fire effects. The actual effects of no mechanical treatments on special status species in the Wilderness would depend on the location, timing, extent and severity of future wildfires.

3.3.6 Water Resources

3.3.6.1 Affected Environment

The Seashore is surrounded by saltwater resources including 17.5 miles of beaches that lie in an almost continuous strip along the Atlantic Ocean. The remaining shores include a network of salt marshes, tidal creeks, and tidal rivers that eventually open out into the Sounds (St. Andrews Sound to the north and Cumberland Sound to the west and south). The Seashore has three main rivers to the west that bring freshwater to the Sounds—Satilla River, Crooked River, and St. Marys River. The Satilla River enters St. Andrew Sound between Jekyll and Cumberland Islands; the Crooked River enters Cumberland Sound near the island's mid-point; and St. Marys River flows into Cumberland Sound at the southern tip of the island. The Satilla River basin is roughly 250 miles long, and drains an area of approximately 3,940 square miles. The St. Marys basin drains approximately 1,300 square miles, encompassing parts of Georgia and Florida. The Crooked River basin is the smallest draining approximately 68 square miles. The Satilla is the largest river in the area, and because the ocean current runs generally southward, materials from the Satilla River may have a greater influence on the water quality of the Seashore than those that enter from the other rivers. The current in the Atlantic Ocean transports water southward from other Georgia barrier islands, the Satilla River, and from St. Andrew Sound.

Even though the waters surrounding the island and the salt marshes are a critical part of the island ecosystem, NPS only has jurisdiction over those portions of the island that are above the mean high tide line and ownership of marsh lands is spread between the state, NPS, and U.S. Army Corps of Engineers.

Surface Water (including wetlands)

The Seashore has two rivers (Cumberland and Brickhill Rivers), 10 creeks, and a number of permanent and temporary freshwater ponds and lakes. Lake Retta and South End Pond are permanent saline water bodies that have an outlet to the ocean and are inundated regularly enough to remain brackish. There are several outflows that connect waterbodies to the ocean or sounds including Whitney (South Cut) and Lake Retta Outflows (Big Slough Overflow; Frick et al. 2002). These are places where the water flows out and eventually connects with the ocean or sounds. For example, the Whitney Outflow will drain portions of the Sweetwater complex when heavy rains or high surf and tides create a connection.

Cumberland Island has the largest and most diverse system of wetlands on any of Georgia's barrier islands (Hillestad et al. 1975) with approximately 45% (16,500 acres) of the Seashore classified as wetlands. The wetlands consist of salt marshes, mud flats, tidal creeks, and more than 2,500 acres of freshwater wetlands that range from permanent and semi-permanent ponds to seasonal wetland areas including emergent, scrub/shrub, and forested palustrine areas (Frick et al. 2002). The wetlands in the upland portion of the Island mostly consist of palustrine forest (56.9%), palustrine emergent (25.9%), palustrine scrub/shrub 15 %), palustrine lake (1.0 %), and palustrine aquatic bed (1.0%; Frick et al. 2002). Other wetland types present within the boundaries of the Seashore include estuarine salt marshes and tidal creeks located primarily on the western side of the island and on beaches along the eastern side. The wetlands can be categorized into 3 classes based on the Cowardin system—palustrine, estuarine, and marine (Cowardin et al. 1979, Frick et al. 2002). Intertidal areas (i.e. beaches and most of the salt marsh) and subtidal areas (i.e. tidal creeks and estuarine waters) are held in public trust by the state of Georgia and are managed by the Coastal Resources Division of the Georgia Department of Natural Resources (CRD).

Many of the wetlands on the Seashore are associated geomorphically with dune and swale topography (Odum and Harvey 1988). These interdunal wetlands are present where (1) dune and swale topography has persisted since at least the middle to late Holocene (2,000 to 5,000 years before present), (2) a lens of fresh ground water intersects the bottoms of the swales, and (3) extensive flooding by seawater is infrequent (Odum and Harvey 1988). Many of these freshwater wetlands are in swales between dunes and result from trapping rainwater in the narrow areas between dunes or from ground-water discharge into closed or nearly closed surface depressions (Hillestad et al. 1975). Other major freshwater wetlands on the Seashore include those associated with low-lying areas in interior portions of the island and areas adjacent to estuaries on the northern and southern portions of the island. Intertidal emergent wetlands on the western side of the island are the most extensive wetlands on Cumberland Island.

Freshwater wetlands increase biodiversity on barrier islands by providing habitat for animals such as frogs, salamanders, water snakes, turtles, and aquatic mammals—all of which are largely absent from barrier islands lacking freshwater habitats (Bellis 1995). Barrier-island freshwater wetlands commonly provide the only dependable source of water for upland fauna such as whitetail deer and feral horses and hogs. In addition, wetlands provide habitat for aquatic plants, aquatic invertebrates, and fishes, as well as nesting, feeding, and roosting areas for wading and shore birds. Federally listed animals, including Wood Storks (endangered) and the American Alligator (delisted in 1987) are known to use freshwater aquatic habitats on the Seashore for portions of their life cycle (Hillestad et al. 1975).

Freshwater wetlands on Cumberland Island occur in a range of physical settings, with varying degrees of permanence and connectivity to seawater. Odum and Harvey (1988) indicated that freshwater interdunal wetlands are rare and fragile resources, occur on a number of barrier islands in the southeastern U.S., and are sufficiently varied and limited in total area to warrant preservation and management. The integrity and viability of interdunal wetlands and ponds are dependent on protection of the dune and swale systems from erosion and direct alteration and protection of the barrier island's surficial aquifer. Plant communities, wildlife, and aquatic animals are closely linked to the island's wetlands, which provide habitats to some threatened or endangered organisms (e.g., Wood Stork).

Wetlands and surface-water features on Cumberland Island represent a broad range of hydrologic and biologic conditions that may be related to different successional stages. Water-level fluctuations, fire, and changes in salinity due to seawater inundation and to evaporation are perturbations that affect wetland extent, characteristics, and biologic conditions (Hillestad et al. 1975). These somewhat regular perturbations help prevent or slow successional processes that lead to wetlands infilling and disappearing (Hillestad et al. 1975). Currently, most of the freshwater areas on the Seashore are likely undergoing natural vegetative succession from open water habitat with submerged vegetation (through floating vegetation, emergent vegetation, then shrubs) to a lowland mixed hardwood forest community (Alber et al. 2005).

Ground Water

The primary Seashore groundwater sources of drinking water for residents, park employees, and visitors comes from the surficial and Upper Floridan aquifers. The deep-lying and confined Upper Floridan aquifer is important regionally for industrial and municipal uses and supplies drinking water for almost all domestic wells on the Seashore. The shallower Pliocene and late Miocene deposits that comprise most of the water-bearing zones of the surficial aquifer also have been used, primarily by the NPS, as a drinking-water resource on the island. Unconfined portions of the surficial aquifer are important for sustaining freshwater wetland ecosystems on Cumberland Island.

The surficial aquifer consists of unconsolidated sands, clays, and gravels that are recharged locally by rainfall. Water levels in the surficial aquifer vary seasonally and respond to local changes in recharge and discharge. Rainfall and seepage from wetlands is the primary source of water to the aquifer. Water is discharged from the surficial aquifer by evapotranspiration and flow to wetlands, coastal areas, and locally to wells. Wells in the surficial aquifer have a higher risk of saltwater intrusion and contamination than those in the Floridian aquifer.

The Upper Floridian aquifer consists of limestone and dolomite and varies in thickness from 600- to 700-feet and is confined (Miller 1968). This aquifer is recharged shoreward from the island, and is used extensively as a source of industrial (off-island) and public water supply. The Floridian aquifer has been subject to long-term declines in water levels and in some areas to saltwater intrusion or encroachment (Spechler 1994). Water withdrawn from the Upper Floridan aquifer generally contains a sufficient concentration of hydrogen sulfide to produce an odor and affect the taste. Most domestic water-supply wells on the Seashore are connected to oxidation vats to facilitate the dissipation of hydrogen sulfide (Hillestad et al. 1975).

Water Quality

The Environmental Protection Division (EPD) of the Georgia Department of Natural Resources and US Environmental Protection Agency (EPA) has not identified any waters as 303(d) or 305(b) waters not supporting designated uses within the Seashore. Every water body in the State of Georgia has one or more designated uses. Section 305(b) of the Clean Water Act requires states to assess and describe the quality of its waters every two years in a report called the 305(b) report. Section 303(d) of the Clean Water Act requires states to submit a list of all of the waters that are not meeting their designated uses. For waters identified as a 303(d) reach, a water quality improvement plan must be developed. The water quality improvement plan known as Total Maximum Daily Load establishes allowable pollutant loads set at levels to achieve water quality standards and is the responsibility of the state EPD. The EPA must then approve these plans.

Past water-quality studies done at the Seashore have collected physical, chemical and biological data for many lakes, streams and wetlands. Much of the variation in water-quality constituents among studied water bodies on the Seashore may be attributed to (1) proximity to the ocean and the relative degree of tidal influence; (2) the amount and type of ground-water and surface-water interactions; and (3) recent and long-term rainfall patterns. Large variations in many constituents have been observed at Whitney outflow, Lake Retta outflow, and South End Ponds. Variations in water quality were most likely the result of intermittent inflow or inundation by saline water from the Atlantic Ocean and temporary inundation by saline to brackish water from Cumberland Sound.

Water bodies that are more frequently inundated by saline or brackish water from the Atlantic Ocean or Cumberland Sound tend to have water compositions more similar to seawater (with high concentrations of total dissolved solids, sodium, chloride, and sulfate) than water bodies where the primary oceanic influence is from salt aerosols. The relative abundance of major ions and total-dissolved-solids concentrations in surface-water samples collected from water bodies on the Seashore provide some insight into potential sources of water and influences on water quality. Past studies indicate sources of water and influences on water quality for the Seashore's water bodies comes from a variety of resources—marine waters, salt aerosol, ground-water discharge, and rainwater (Albers et al. 2005).

3.3.6.2 Methodology and Intensity Threshold

The methodology used for assessing water resource impacts included using available GIS data and literature to identify the water resources present and identifying the potential effects to water resources (i.e., surface and ground water) by the action alternatives. The thresholds of change for the intensity of an impact are defined as follows:

Negligible: Neither water quality nor hydrology would be affected, or the changes would be either non-detectable or if detected, would have effects that would be considered slight and non-measurable.

Minor: The action would change hydrology or water quality, but the change would be small, localized, and of little consequence. Mitigation measures, if needed to offset adverse effects, would be simple and successful.

Moderate: The action would change hydrology or water quality; the change would be measurable and of consequence. Mitigation measures, if needed to offset adverse effects, could be extensive, but would likely be successful.

Major: The action would noticeably change hydrology or water quality; the change would be measurable and result in a severely adverse or major beneficial impact with regional consequences. Extensive mitigation measures would be needed to offset any adverse effects, and their success would not be guaranteed.

Duration:

Short-term: If water quality recovers in one year or less.
Long-term: If water quality recovers in more than one year.

3.3.6.3 Analysis of Alternatives and Impacts on Water Resources

Impacts of Alternative 1: No Action Alternative

Under this alternative, the Seashore fire management program would be limited to wildfire suppression activities. Lack of active vegetation management tools would reduce ecological restoration and defensible space actions. This would allow the retention and continued buildup of hazardous fuels, hindering restoration and maintenance of fire-adapted systems and other unique vegetation areas. This could lead to a buildup of hazardous fuels, which could lead to more intense wildfires during dry conditions where fires are difficult to suppress/manage. More intense wildfires could also increase soil erosion due to soils becoming hydrophobic and removal of most vegetation during stand replacing wildfires. Potential increased erosion could result in increased turbidity, sedimentation (i.e., ash), and debris flushes with reduced water quality, and potentially large pulses of water delivered to water bodies within the Seashore. Removal of vegetation along banks could result in increased water temperatures due to limited shading and increased nutrient cycling, therefore decreasing the availability of oxygen to fish and other aquatic organisms. The amount of runoff would likely increase stream or river flows, changing the hydrologic regime and possibly increasing channel erosion in the short-term. The degree of impacts would depend on the severity and extent of the wildfire and rain events. In addition, large-scale wildfires and intense removal of vegetation could make the island more vulnerable to hurricane overwash, and storm related ocean or flood erosion, causing loss of island land mass, conversion of upland areas to dune areas, or drastic river channel changes. Indirect effects would be adverse, minor to moderate, localized, long-term impacts due to increased soil erosion, turbidity, and sedimentation, reduced water quality, and potential pulses of water.

The use of fire retardants or foams, usually by helicopter or fixed wing aircraft, could potentially cause short and long-term impacts to water resources if misapplied or mishandled. Retardants contain ammonia and phosphate or sulfate ions, which can temporarily change the chemistry of a water body, thus making it lethal to fish and other aquatic organisms. Foams contain detergents that can interfere with the ability of fish gills to absorb oxygen. The degree of impact would depend on the volume of retardant/foam dropped into the water body, the size of the water body, and the volume of flow in the stream or river. However, since mitigation measures limit the use,

type, and proximity to water bodies by foam and fire retardants, impacts to water quality would be minimal or negligible.

In wildfire suppression tactics, fire engines and other equipment are sometimes driven off-road to control the fire perimeter. In many areas of the Seashore, this would be difficult to impossible due to the thick ground vegetation, sandy soils, and trees. With an appropriate response, there would be less fireline constructed and less off-road use of engines, as natural barriers or existing well defined roads are more likely to be used as firelines to confine wildfires. The direct adverse effect of fire suppression efforts would be negligible unless water was drawn from Seashore surface freshwater sources via buckets or pumped for firefighting. If this occurred, the direct adverse effects of reduced flow would be localized, short-term (hours), and minor. Indirect adverse effects could include destabilizing stream banks or pond shores due to shoreline trampling, equipment use, or nearby off-road travel with fire engines and other equipment. These impacts would be mitigated by minimizing off-road travel and prompt rehabilitation of any damaged shorelines or stream banks.

Using brackish water bucket drops could allow infiltration of saltwater to groundwater through the soil. However, past water-quality studies have shown that some water bodies within the Seashore recharge are influenced by direct inundation of marine waters or input from salt aerosol (Frick et al. 2002). In addition, the Floridian aquifer that provides drinking water to the residents, visitors, and Seashore staff also has a natural transition zone within which there is mixing between freshwater and saltwater (Barlow 2003). Although the ocean is the primary source of saline for ground water, a number of secondary sources can also impact ground water quality. These sources include precipitation, as airborne salts (chloride and sodium) are abundant in air masses over the ocean and may increase salts to soils, shallow surface waters, and ground water by evapotranspiration and evaporation; and sea-spray accumulation, tides, and storm surges, can be local sources of increased ground-water salinity in low-lying coastal areas (Barlow 2003). Because the ocean is usually too rough for safe dipping by helicopters, helicopter dipping at the Seashore in the past has been from the brackish or fresh river waters. The salt concentration in adjacent river waters varies with the dipping location, tide level, river flows, season etc. and is thought to vary widely. Direct adverse effects of brackish water buckets used to suppress wildfires would be localized, short-term, and negligible to minor to water quality.

Adverse, long-term impacts from wildfire could be minor to moderate, depending on the location, severity, and duration of the fire. After the fire event, there could be continued loss of soils and sedimentation into streams, which could carry downstream. The watershed could take several years to a decade to recover following a substantial wildfire.

Cumulative Impacts

Cumulative impacts to water quality from the No Action Alternative plus other disturbances from existing practices at the Seashore and private facilities (septic tanks) would be direct, minor, short-term, and adverse. However, there is the potential for indirect impacts to water quality from future severe wildfires, which would be minor to moderate, long-term, adverse, and localized due to reduced acres of successful restoration and continued and increased hazardous fuel buildup.

Conclusion

The No Action Alternative would result in long-term, minor to moderate, adverse impacts to water quality because of the increased chance of severe fire, resulting in increased runoff of soil and ash into streams, an increase in stream temperature, and higher temporary nutrient loading. There could also be a potential increase in channel erosion with locally long-term, minor to moderate adverse, effects expected in case of more extreme and/or widespread fire. Cumulative effects would be short- to long-term, minor, and adverse.

Impacts to Alternative 2: Preferred Alternative

Water Resource impacts under this alternative would be the same as the No Action Alternative for wildfire suppression; however, wildfires managed for resource objectives over time under this alternative would decrease the potential for intense, large wildfires and would move toward having impacts within the range of naturally occurring wildfires. The use of more active vegetation treatment tools would increase the ability and efficiency to reduce hazardous fuel loads, including removing dead trees and debris clogging streams and to create and/or maintain defensible space, reducing the potential for an uncharacteristic wildfire. The increased reduction of hazardous fuels would benefit water resources with lower intensity ground fires that have less impact on soil runoff when compared to more intense wildfires and are easier to manage/suppress. Over time, there would be less need and use of fire suppression aircraft, thus reduced use of fire retardant, helicopter foam, and brackish water bucket drops. Thus, the Preferred Alternative would have indirect, minor to moderate, beneficial, long-term, and localized impacts by increasing the potential for lower intensity ground fires and increasing the overall health and vigor of vegetation communities.

Prescribed fire may reduce vegetation along the stream banks, thus temporarily increasing stream temperatures, soil erosion, and sediment yield. This could lead to turbidity and sedimentation of surface water resources in the Seashore. Turbidity and sedimentation can alter the hydrologic regime of surface waters and adversely affect aquatic habitats, invertebrates, and fish. The potential for an increase in turbidity and sediment delivery in water bodies within the Seashore as a result of soil erosion following prescribed fire activities could occur. However, impacts from soil erosion would only be direct, minor, adverse, short-term, and localized. In addition, impacts following a prescribed fire would be reduced and/or eliminated during the "green-up" as new herbaceous cover developed.

Historically, wildfires helped shape the native vegetation and ecosystems of the Seashore (Van Lear and Waldrop 1989, Frost 1998). Wetland plant communities have evolved with a periodic fire regime and require it to maintain the open vegetation communities with sparse overstories and abundant herbaceous cover. They are one of the islands fire adapted vegetation communities. Wetland plant species possess adaptations to fluvial disturbances that facilitate survival and reestablishment following fires, thus contributing to the rapid recovery of many wetland vegetation communities. In addition, prescribed fires emulate the natural fire regime and are beneficial to wetlands by providing an influx of nutrients to the soil from the plant biomass burned, stimulates seed production, and helps to perpetuate the vegetation and wildlife species associated with wetlands (Craft and Casey 2000, Battle and Golladay 2001). Temporary increases in temperatures, soil erosion, and sediment yield could result from prescribed fire and wildfires managed for resource objectives due to reduced vegetation along the riparian/wetland banks. However, problems with

temperature and soil erosion would only result in direct, minor, adverse, short-term, and localized impacts.

Wildfires managed for resource objectives would have the same impacts as the No Action Alternative in regards to fire suppression and the same beneficial impacts as prescribed burning as described above. Wildfires managed for resource objectives over time under this alternative would decrease the potential for intense, large wildfires. Wildfires would move toward having impacts within the range of naturally occurring wildfires, thus reducing impacts from fire suppression activities.

Direct impacts from mechanical and manual fuel reduction treatments to water resources could be adverse, localized, short-term, and negligible due to trampling of riverbanks or similar disturbances by felled trees. However, mechanical fuel reduction projects would not occur near streams or surface waters and impacts would be mitigated by avoidance, where possible, and immediate rehabilitation using the appropriate mitigation measures. Indirect impacts to water resources from slightly increased streamflow would be localized, short-term, adverse, and negligible due to a reduction in vegetation and thus less transpiration on the treated area.

All treatment areas would have individual treatment plans submitted for herbicide use to be approved at the state and regional levels. Approval may be given by the regional and national level staff after considering numerous factors including: the target use, location where the application will occur, potential T&E species concerns, potential for getting into surface or ground water, persistence in the ecosystem, safety to employees and the public, type of application (example, spot spraying), etc. (See section 2.6 Mitigation Measures). Furthermore, streamside management zones (SMZs) would be placed around all water bodies and herbicide labels would be followed to make potential for herbicide drift unlikely. All water features would have the appropriate SMZs placed on all sides to assure that there would be essentially no opportunity for spray, directly or in drift, to enter those waters (Georgia Forestry Commission 2009). SMZs are based on stream type and slope class present.

Cumulative Impacts

Cumulative impacts to water quality from the Preferred Alternative in combination with existing practices at the Seashore and private facilities (septic tanks) would be direct, minor, short-term, adverse and beneficial.

Conclusion

The Preferred Alternative would result in direct, minor, adverse, short-term, and localized impacts as well as direct, minor, long-term, beneficial, localized cumulative impacts from fire management activities. Cumulative effects under this alternative would be direct, minor, short-term, adverse and beneficial, and localized.

Impacts to Alternative 3: No Mechanical Treatments in Wilderness

Water quality impacts would be the same as Alternative 2, except no mechanical treatments would occur in the Wilderness. This would minimize the temporary minor impacts associated with

increased vegetation/soil disturbance from power tools or mechanical equipment used to reduce hazardous fuels by creating and/or maintaining defensible space and fuel breaks. However, this would make the reduction of hazardous fuels more problematic and less effective in the wilderness (~20,500 acres) limiting prescribed burns and wildfire managed for resource objectives, likely leading to larger and more intense wildfires that are harder to manage/suppress within and adjacent to the Wilderness than Alternative 2. Increased potential for severe wildfires could result in same impacts as Alternative 1 from increased soil erosion due to soils becoming hydrophobic and removal of most vegetation during stand replacing wildfires. Potential increased erosion could result in increased turbidity, sedimentation (i.e., ash), and debris flushes with reduced water quality, and potentially large pulses of water delivered to water bodies within the Seashore. Removal of vegetation along banks could result in increased water temperatures due to limited shading and increased nutrient cycling, therefore decreasing the availability of oxygen to fish and other aquatic organisms The amount of runoff would also increase stream or river flows, changing the hydrologic regime and possibly increasing channel erosion in the short-term. The degree of impacts would depend on the severity and extent of the wildfire and rain events. Indirect effects would be adverse, minor to moderate, localized, long-term impacts due to increased soil erosion, turbidity, and sedimentation, reduced water quality, and potential pulses of water. Impacts would be adverse, minor to moderate, localized, and short- to long-term due to increased potential for locally severe fire effects on water resources.

Cumulative Impacts

Alternative 3 would have an increased potential for wildfire and associated fire-suppression activities due to lack of fuel breaks and barriers to stop wildfires, since there would be less effective hazardous fuels reduction from no mechanical treatments in the Wilderness. Overall, Alternative 3 actions combined with impacts of existing practices at Seashore and private facilities (septic tanks) that could affect water resources would be minor, short-term, and adverse. However, there is the potential for indirect impacts to water quality from future severe wildfires, which would be minor to moderate, long-term, adverse, and localized due to reduced acres of successful restoration and continued and increased hazardous fuel buildup.

Conclusion

Impacts would be adverse, minor to moderate, localized, and short- to long-term due to increased potential for locally severe fire effects on water resources. Cumulative impacts would be minor, short-term, and adverse. As well as indirect, minor to moderate, long-term, adverse, and localized due to reduced acres of successful restoration and continued and increased hazardous fuel buildup.

3.3.7 Wilderness

3.3.7. Affected Environment

On September 8, 1982, approximately 20,500 acres, mostly the northern half of Cumberland Island, was recommended to Congress for formal wilderness designation. This included approximately 11,700 acres recommended as potential wilderness and approximately 8,800 acres recommended as wilderness to be managed as part of the National Wilderness Preservation System (PL 97-250, as amended by PL 108-447, 16 U.S.C. 113). The Cumberland Island Wilderness Boundary Adjustment

Act of 2004, Public Law No: 108-447, adjusted the boundary of the Cumberland Island Wilderness to remove several 25-foot wide corridors from the wilderness, consisting of the Main Road, Plum Orchard Spur, and North Cut Road. The Act also removed potential wilderness designation from the High Point–Half Moon Bluff Historic District at the north end of Cumberland Island and added potential wilderness designation to a 231-acre strip of upland running along the northern perimeter of Stafford Field; current total of Congressionally designated wilderness is approximately 9,886 acres and about 10,500 acres of potential wilderness (Figure 2). All lands designated as wilderness or potential wilderness at the Seashore are managed to protect wilderness character and values. The potential wilderness consists of private lands without reserved rights and State-owned intertidal areas. These lands provide visitors an opportunity to experience the Seashore's wild natural landscape and other wilderness values.

The 1964 Wilderness Act defined wilderness as "an area where the earth and its community of life are untrammeled by man." In addition, the act states "except as necessary to meet the minimum requirements for the administration of the area for the purposes of this act, there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation within any such area." The act also contains a special provision allowing for the use of aircraft in the control of fire.

The National Park Service is charged with preserving and enhancing the wilderness character of the wilderness areas it administers. Wilderness character is assessed in reference to five separate qualities: natural, untrammeled, undeveloped, opportunities for solitude or primitive and unconfined recreation, and (where applicable) other features.[1] The four principle qualities of wilderness character to be assessed here are as follows:

- *Natural*: Wilderness maintains ecological systems that are substantially free from the effects of modern civilization.
- *Undeveloped*: Wilderness retains its primeval character and influence, and is essentially without permanent improvements or modern human occupation.
- *Untrammeled*: Wilderness is essentially unhindered and free from modern human control or manipulation.
- *Solitude or Primitive and Unconfined Recreation*: Wilderness provides outstanding opportunities for solitude or a primitive and unconfined type of recreation.

The wilderness character of Cumberland Island National Seashore is briefly summarized below:

> ***Natural***: The Cumberland Island Wilderness protects a diverse array of natural habitats, plants, and animals that are substantially free from the effects of modern civilization. However, much of the forested portion of the wilderness was grazed and cultivated during the plantation era and afterwards. Likewise, the entire island was logged in the 18th, 19th, and 20th centuries. Thus, the overwhelming majority of today's interior vegetation communities are the product of human disturbance, departing from natural conditions as a result of two centuries of logging, agriculture, and the exclusion of naturally occurring wildfire by effective fire suppression.

[1] For more details on wilderness character see "Keeping it Wild in the National Park Service. A User Guide to Integrating Wilderness Character into Park Planning, Management, and Monitoring" (NPS 2013) and "Keeping It Wild: An Interagency Strategy to Monitor Trends in Wilderness Character Across the National Wilderness Preservation System" (Landres 2008; available online at: http://leopold.wilderness.net/pubs/654.pdf)

The natural quality of the wilderness is degraded by existing developments on the island, such as houses on reserved estates, overhead and underground power lines, and roads. A more pervasive impact to the natural character of the wilderness has been the persistent suppression of wildfire and the past decision not to use prescribed fire. These management actions have altered the natural fire regime and vegetation character of the wilderness.

Although the NPS has had success in controlling the spread of exotic plants, the presence of nonnative feral animals, such as pigs and horses, detracts from the natural quality of the Cumberland Island Wilderness by affecting natural successional processes and vegetative patterns.

Undeveloped: Most of the Cumberland Island Wilderness is undeveloped. However, the area has a long history of human occupation and use, and some private property, improvements, and development exists within the wilderness boundary. The most prominent development consists of a small number of residential structures on reserved estates, and the dirt roads leading to them. In addition, the Main Road, although technically outside of designated wilderness, divides the wilderness and provides the area with more vehicular access than is typical in most wilderness areas.
Evidence of historic agricultural use can be found in parts of the wilderness, including dumps, causeways, old wooden silos, and abandoned barbed-wire fences. The undeveloped quality is also degraded in places by features such as communication equipment, utility corridors, and research installations. On rare occasions, the authorized use of motorized equipment (e.g. chainsaws, etc.) by park personnel will degrade this quality. Such usage either occurs during emergency incidents or is authorized as the minimum tool to implement a planned activity as determined in a minimum requirements analysis.

Untrammeled: Apart from the exclusion of natural fire due to historic fire suppression efforts, and climatic and oceanic forces, including more recently measured effects of climate change, the Cumberland Island Wilderness is allowed to function essentially unhindered and free from modern human control or manipulation. Nevertheless, much of the upland portion of the wilderness is a landscape in transition due to past human land-disturbing activities. While the land has substantially rebounded in recent decades, natural systems are still influenced by the legacy of past human disturbance, as well as the ongoing disruption of the natural fire regime from past and current fire suppression practices within the park boundary.

Natural processes are degraded in some places by existing development. NPS management actions in the wilderness sometimes degrade the untrammeled quality, but these are only taken when determined to be necessary for the administration and preservation of wilderness resources or to protect reserved estates. Examples of such management activities include functions such as monitoring and protecting endangered species, accessing and preserving cultural resources, and managing fires.

Solitude or Primitive and Unconfined Recreation: Visitors to the wilderness come to experience the area's opportunities for solitude, risk, and challenge in addition to viewing the functioning natural systems. The wilderness itself is miles from the ferry drop-off and generally visited only by determined hikers and backpackers. The result is an enhanced sense of solitude on the north end of the island.

> Though the island offers solitude to many, there can be detractions from the visitor experience. In some instances, the natural soundscape may be affected by industrial and military facilities to the south and west, persistent mid- and low-level aircraft over flights, and vessel traffic on the waterways surrounding the island. Additional impacts stem from day-to-day human activities associated with park management, occupation of the reserved estates, and operation of the Lands and Legacies Tour. Beach driving, which can be seen and heard from the wilderness, is allowed by state law and regulated by the Georgia Department of Natural Resources.

All fire management activities affecting wilderness must utilize the minimum requirement analysis (MRA) concept defined in NPS Reference Manual 41. This planning tool and documentation process is used to determine if administrative activities affecting wilderness resources or the visitor experience are necessary, and if so, to develop techniques to minimize impacts. The MRA is applied as a two-step process: (1) it determines whether the proposed fire management action is appropriate or necessary for administration of the area as wilderness and does not pose a significant impact to wilderness resources and character; and (2) it analyzes the techniques and type of equipment needed to ensure that the impacts to wilderness resources and character are minimized.

Fire management tools that are being proposed in this EA for hazardous fuel reduction, ecological restoration, and to effectively maintain unique ecosystems in the Wilderness include but are not limited to hand tools such as ax, pulaski, cross-cut saw, pruners, and shovels; handheld motorized equipment such as weed eaters, chainsaws, leaf blowers, or similar; and masticators or brush cutters. Wildfire suppression equipment that may be used includes fire engines, pumps, chainsaws, and hand tools as listed above, helicopter and fixed wing aircraft, support boats, masticators and dozers (rare), and brush engines.

This EA is intended to analyze the impacts of each alternative on the human environment. It is also intended to fulfill the first step of the minimum requirements analysis by answering the questions of whether or not any administrative action is necessary in wilderness. As such, each alternative includes a determination of whether the proposed fire management action is appropriate or necessary for administration of the area as wilderness and does not pose a significant impact to wilderness resources and character (see Figure 3 for the MRA process). Research and knowledge of Seashore lands and resources indicate that past human activities, development, and the exclusion of natural fire has disrupted the natural fire regime in the fire-adapted ecosystems of the Cumberland Island Wilderness. Due to fire exclusion, there has been a significant accumulation of hazardous fuels proximal to and adjacent to park structures and private inholdings, posing a significant risk to those features. In addition, the vegetative changes and build-up of hazardous fuels have increased the likelihood of fire effects that are unwanted and outside of the range of natural variability. At this point in time, fire dependent ecosystems, including plant and animal species are at risk from severe wildfire due to the prolonged duration of fire exclusion in their habitats. These aforementioned situations validate why administrative action needs to occur within the Seashore wilderness.

NPS Management Policies 2006, Section 4.5 Fire Management, and Director's Order 18 provide direction for the implementation of fire management activities on NPS lands. NPS Director's Order 41 provides the authority to implement fire management actions in Wilderness. Section 6.7 of Director's Order 41 states that "In many NPS wilderness areas fires resulting from natural ignitions are considered a natural process that contributes to ecosystem function and are necessary to maintain

wilderness in an unimpaired condition. As a result of many factors, including past fire management actions within wilderness, and the need to control wildfires on adjacent lands, fire is not adequately functioning as the natural change agent that would have been present in the ecosystem in the past. In those cases, augmenting natural ignitions with prescribed fire or other fuel treatments within wilderness may be necessary to restore or maintain ecological function."

In wilderness areas such as the Cumberland Island Wilderness, where wildfire has played a role in shaping and maintaining the ecological systems, natural fire is considered a fundamental component of the wilderness environment. While these ecological systems have been impacted by historic activities, research science and published literature suggest that these systems can be restored over time with careful reintroduction of wildland fire using both prescribed fire (planned ignitions) and wildfire (unplanned ignitions) managed to achieve resource objectives, supplemented with the limited use of non-fire vegetation treatments. "Natural" fire must be a natural (lightning) ignition and is managed as a wildfire, using a selected strategy and identified incident objectives, which may include resource objectives. It is important to understand the concept of managing wildfire for resource objectives under policies of the National Park Service. It does not require that all natural fires be managed for resource objectives. Based on a number of factors including a relative risk assessment, the Park Superintendent will define a course of action for managing any wildfires that burn within the park boundary. Some wildfires may have multiple objectives; one flank may be suppressed where it is approaching NPS facilities or values to be protected, while another flank is allowed to burn in order to achieve resource objectives. The primary resource objective of these fires is to restore and maintain natural fire regimes and ecosystem stability by altering vegetative fuel conditions to within the range of natural variability. While some amount (usually small) of stand replacing fire is natural, a goal is to reduce long-term ecosystem impacts from widespread high severity or extensive crown fire.

Natural ecological processes such as fire would be allowed to continue in Wilderness when possible to help restore and maintain wilderness ecosystems and natural habitat. Since Cumberland Island contains numerous fire-adapted vegetation complexes, the NPS considers wildland fire an important ecological process that needs to be utilized and properly managed in the Seashore wilderness area.

3.3.7.2 Methodology and Intensity Threshold

The methodology used for assessing wilderness impacts included using available literature to identify potential effects to wilderness resources (e.g., vegetation communities, wildlife composition) by the action alternatives. The thresholds of change for the intensity of an impact are defined as follows:

Negligible: Impacts would result in a change to wilderness character, but the change would be so slight that it would not be of any measurable or perceptible consequence.

Minor: Impacts would result in a change to wilderness character and associated values that would be detectable, but the change would be small and of little consequence and would be expected to be localized.

*Moderate***:** Impacts would result in a change to wilderness character and associated values that would be readily detectable but localized.

*Major***:** Impacts would result in a change to wilderness character and associated values. It would be measurable and would have a substantial or possibly permanent consequence.

Duration:

*Short-term***:** Wilderness effects would extend duration of proposed project.
Long-term: Wilderness effects would extend beyond duration of proposed project.

3.3.7.3 Analysis of Alternatives and Impacts on Wilderness Character

Impacts of Alternative 1: No Action Alternative

Under this alternative, there would be beneficial impacts to the untrammeled quality of wilderness character because there would be no active manipulation of the landscape except during fire events. However, the natural quality of wilderness would be adversely affected in two ways. First, fire-adapted vegetation communities would continue to degrade from natural conditions due to fire suppression. Second, hazardous fuels would continue to build up due to a lack of natural or active vegetation management, increasing the potential for more intense and larger wildfires than would otherwise occur. Overall effects on wilderness character and associated resources could be long-term, adverse, and moderate to major, depending on the length of time between fires, and size and intensity of the wildfire and the level of suppression efforts required. Due to fuel buildup, fires could burn intensely and be stand replacing to a much greater degree than would occur under natural conditions. Large tracts of land in the wilderness area could be affected; this would adversely affect the visual character, soils, vegetation, wildlife, and air quality as fires could be uncharacteristic in size and intensity due to the excessive fuel buildup. In addition, fire suppression actions would be focused on stopping wildfires where located at the time it is safe for ground crews. This work could adversely affect the undeveloped quality of wilderness character by requiring a large human presence and extensive use of aircraft, and use of mechanical tools and equipment. All wildland fires within wilderness would be managed considering wilderness characteristics and associated resource values while providing for public and firefighter safety using the full range of strategic and tactical options. Wildland fire management response would include the application of minimum impact suppression techniques and minimum tool requirement techniques (i.e., MRA). With the application of the minimum tool analysis, Alternative 1 would have, on balance, long-term, direct, moderate to major, adverse impacts on wilderness character.

Cumulative Impacts

Cumulative impacts to wilderness resources would occur from No Action Alternative plus other activities including park maintenance, north end tours, expiration and removal of reserved estate properties, and commercial and private boat traffic along the Cumberland River and Atlantic Ocean. Firefighter presence in wilderness would have a negligible to minor, short-term adverse cumulative effect. Aircraft use associated with fire management activities, when combined with the impacts from commercial aviation, may temporarily detract from visitor experience. Overall, Alternative 1 actions combined with impacts of other actions that could affect wilderness character would result in long-term, minor to moderate, adverse cumulative impacts to wilderness character.

Conclusion

The No Action Alternative would result in long-term, direct, moderate to major, adverse impacts due to increased potential for future severe wildfires from potential fuel buildup and increased human presence required for fire suppression efforts. Cumulative impacts to wilderness resources under this alternative would be minor to moderate, long-term, adverse, and localized. MIST tactics and when possible analysis of minimum tool requirements would be used in all wilderness areas to keep adverse impacts from firefighter actions to minimal levels. There would be no way to minimize the adverse impacts from larger and more intense wildfires on the natural environment utilizing this alternative.

Impacts of Alternative 2: Preferred Alternative

Wildland fires, including both prescribed fires and wildfires, managed over time under this alternative would decrease the potential for intense, large wildfires and would move toward having impacts within the range of naturally occurring wildfires. Vegetation management tools to be utilized would include prescribed burning, managing wildfire for resource objectives, wildfire suppression, mechanical and manual treatments, and targeted herbicide application. The proposed activities utilized under this alternative would have the indirect effect of lessening the intensity and size of wildfires, decreasing the risk to human life, private property and park infrastructure. Additionally, this alternative decreases the potential impacts on the recreational and scenic values in the long-term. Fire would be restored and maintained as a natural ecological process, thus increasing the ecological integrity of fire-adapted habitats and associated wildlife species and the scenic diversity of vegetation in the wilderness.

Conducting the proposed fire management activities would have varying effects on wilderness character, depending on the action. Conducting fuels treatments would have minor to moderate adverse effects on the untrammeled and undeveloped qualities of wilderness because these activities require modern human manipulation in isolated portions of the landscape, including the use of mechanized equipment. However, the short-term effects of trammeling and the use of developed tools would increase the long-term natural quality of the wilderness by applying fire management activities in fire-adapted areas and protecting sensitive natural resources. Monitoring activities and fuels management support the implementation of fire as a natural ecological process and allow managers to use fire to enhance and maintain the natural quality of the wilderness. In addition, allowing naturally occurring wildfires to achieve resource objectives would have a beneficial effect on both the untrammeled and undeveloped qualities of wilderness.

The wilderness quality of outstanding opportunities for solitude or a primitive and unconfined type of recreation may be infrequently and intermittently impacted by fire management activities. However, in the long run, the effects of the proposed fire management actions on this quality and on the undeveloped quality would be improved, principally because the likelihood of large and damaging wildfires with intensive fire response actions would diminish over time as more natural fuel loads were restored. The proposed fire management actions would also have a beneficial effect on protecting cultural resources, an ancillary attribute and quality of wilderness character. Fire management activities are designed to protect cultural resource values within wilderness and would be expected to have little to no negative impact on cultural resources. Through fire management

activities, sites of historical or cultural significance would have increased level of protection from the effects of unwanted fire spread, with this alternative

Defensible space and fuel breaks would be maintained and/or created using mechanical tools (such as masticators, chainsaws, and brush cutters) along existing trails and roads as described in Section 2.2 of this document. The total amount of wilderness trails that would have mechanical fuel break maintenance work per year is 0–10 acres adjoining the trails. The trails that are expected to be most in need of fuel break work are listed in the Alternatives Considered section under the discussion of Alternative 2. The total amount of herbicide fuel break work per year in the Wilderness is estimated at 0–5 acres. These activities and the altered vegetation along trails would have minor, long-term, adverse effects on the natural and untrammeled qualities of wilderness character, as well as on opportunities for solitude and a primitive, unconfined wilderness experience.

The presence of small work crews, fuels reduction activities (such as thinning and clearing vegetation), and the use of power tools (such as chainsaws and brush cutters) could have short-term, minor impacts to the undeveloped quality of wilderness character, and to opportunities for solitude and unconfined recreation. Use of mechanized tools would be determined based on the outcome of a minimum requirements analysis and would be limited to existing trails and roads. Management activities associated with this alternative would result in short-term, adverse, minor impacts to wilderness character because work crews would only be present for a brief period of time, affected areas would be small, and implementation of mitigation measures and the semi-tropical environment would help ensure rapid recovery of the areas' soils and vegetation.

The MRA would be used when developing specific plans for fuels management actions in the Seashore's Wilderness. This would be done to determine whether or not the proposed management action is appropriate or necessary for administration of the area as wilderness, and whether or not it could pose a significant impact to wilderness resources and character. The MRA will provide direction on the techniques and/or types of tools and equipment (minimum tool) needed to ensure that overall impacts to wilderness resources and character are minimized. The Minimum Requirement Concept is not intended to limit choices. It challenges managers to examine every planned management action to determine if it is appropriate and necessary in wilderness and to choose the best alternative that would least impact unique wilderness resources and character. The purpose and philosophy of wilderness must be considered when evaluating alternatives.

Cumulative Impacts

The wilderness vegetation management actions in Alternative 2 are meant to reverse two centuries of logging, agriculture, and the exclusion of naturally occurring wildfire from effective fire suppression. Once fuels are reduced through a combination of fuel treatments and carefully managed wildfire, the likelihood of high severity and high-intensity fire decreases. Additionally, the need for (NPS) fuels/vegetation management actions will be less, and human wilderness intrusions/management reduced. Thus, Alternative 2 partially offsets the impacts of prior human land management activities, such that cumulative effects to the natural and undeveloped qualities of wilderness character would be long-term and beneficial. Firefighter presence on wildfires and prescribed fires, when combined with normal visitor use, would have a negligible to minor, short-term adverse cumulative effect on the undeveloped quality of wilderness character and on opportunities for solitude. Impacts of actions described under Alternative 2, when combined with impacts of ongoing management actions that

could affect wilderness character, would result in minor to moderate, short-term, adverse cumulative impacts to wilderness character as well as long-term beneficial effects.

Conclusion

Implementation of the Preferred Alternative would have beneficial effects to the natural quality of wilderness character. In contrast to the No Action Alternative, the preferred alternative would have long-term, minor to moderate adverse effects on the untrammeled and undeveloped qualities, as well as to opportunities for solitude and unconfined recreation. The management actions in Alternative 2, while having intermittent and isolated impacts to wilderness, would substantially enhance the natural quality of wilderness character by restoring fire to a fire-adapted ecosystem. The proposed actions would also provide for long-term, beneficial effects to wilderness character through the reduced potential for large and severe wildfires and associated impacts from fire-suppression activities. Overall, Alternative 2 would result in long-term beneficial effects to wilderness character and minor to moderate, short-term, adverse, cumulative effects.

Impacts of Alternative 3: No Mechanical Treatments in Wilderness

Wilderness impacts would be the same as Alternative 2, except no mechanical treatments would occur in the wilderness. This would minimize the temporary minor impacts associated with increased noise and vegetation/soil disturbance from power tools or mechanical equipment used to reduce hazardous fuels by creating and/or maintaining defensible space and fuel breaks. However, this would make the reduction of hazardous fuels more problematic and less effective in the wilderness (~20,500 acres), with corresponding adverse effects to the natural quality of wilderness character. This would limit using prescribed burns and wildfire managed for resource objectives, likely leading to larger and more intense wildfires that are harder to manage/suppress within and adjacent to the wilderness than Alternative 2. In addition, since no or few effective fuel breaks would occur in wilderness due to work crew and practicality concerns, the NPS would have to ensure existing fuel breaks are substantial and adequate outside the wilderness boundary. An example would be that the Main Park Road might require adjacent vegetation to be substantially reduced and/or modified so that it could serve as an effective fuelbreak to help stop potential fires from escaping the wilderness. The lack of mechanical treatments would also hinder restoration and maintenance of fire-adapted systems and other unique vegetation areas, potentially decrease vegetation quality and composition and distribution of wildlife species, and increasing fire risk to cultural resources within and adjacent to the wilderness. As a result, impacts to the untrammeled and undeveloped qualities of wilderness character would be beneficial, but impacts to the natural quality would be adverse, moderate, localized, and short- to long-term due to increased potential for locally severe fire effects on natural and cultural resource wilderness values.

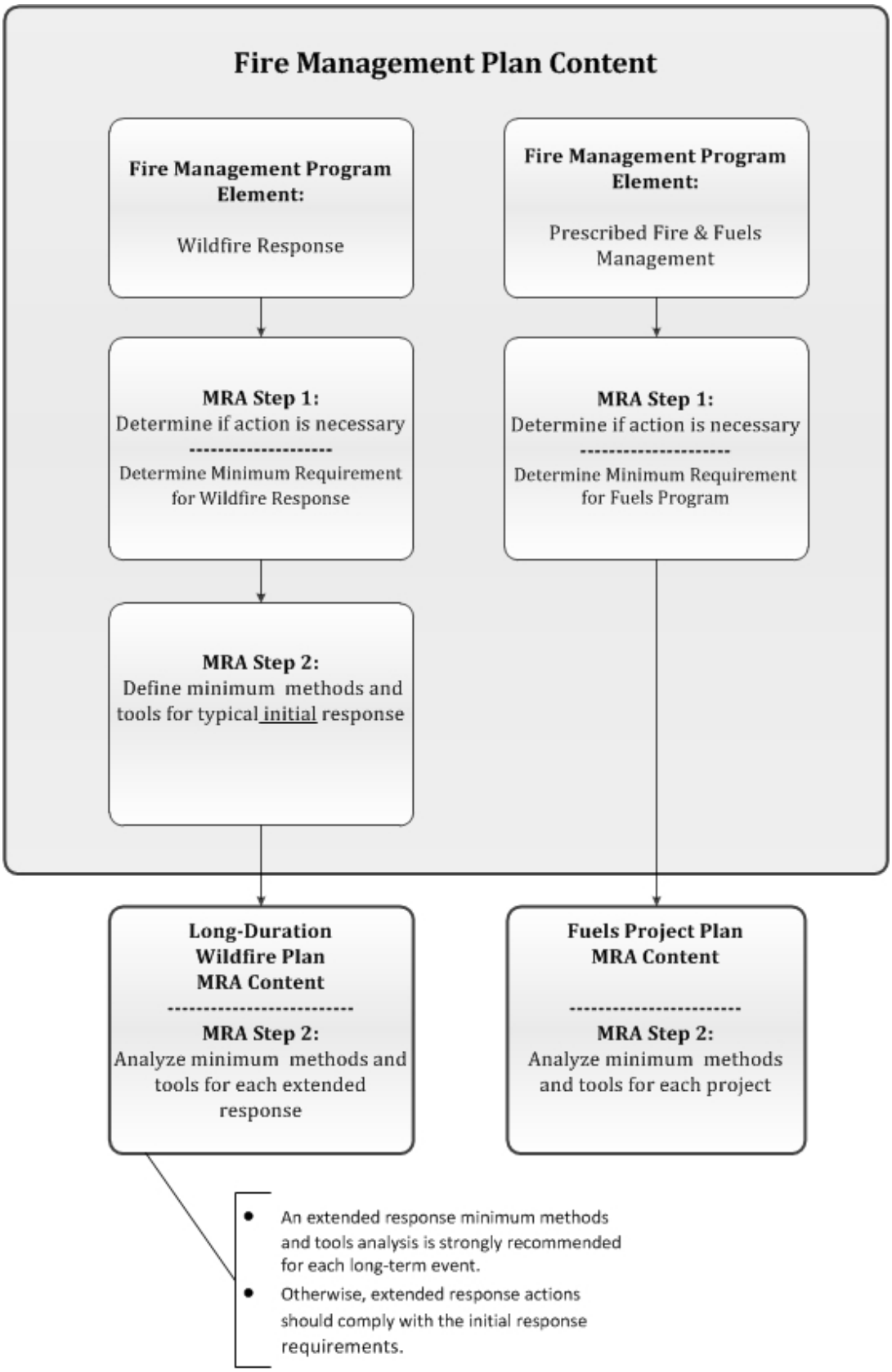

Figure 3. Minimum Requirements Analysis Process

Cumulative Impacts

Due to the continued absence of mechanical treatments in wilderness and a resulting lack of fuel breaks and barriers to stop wildfires, Alternative 3 would have an increased potential for wildfires and associated fire-suppression activities. In addition, unnatural fuel loads would continue to accumulate, and fires would tend to be more severe than under a more natural fire regime. As a result, Alternative 3 would have long-term, moderate, adverse cumulative impacts on the natural quality of wilderness character. Firefighter presence in wilderness, when combined with normal management activities, would have a negligible to minor, short-term adverse cumulative effect on the undeveloped quality and on opportunities for solitude. Aircraft use associated with fire management activities, when combined with ongoing commercial aviation activity, may temporarily detract from visitor experience. Overall, Alternative 3 actions combined with impacts of other actions that could affect wilderness resources would result in long-term, minor to moderate, adverse cumulative impacts to wilderness character.

Conclusion

Impacts to the untrammeled and undeveloped qualities of wilderness character would be beneficial due to a lack of mechanical treatment. However, impacts to the natural quality would be adverse, moderate, localized, and short- to long-term due to increased fuel loads and the increased potential for locally severe fire effects. Cumulative effects to wilderness character would be long-term, minor to moderate, and adverse. Analysis of minimum tool requirements and MIST techniques would be used in all wilderness areas to keep adverse impacts to minimal levels.

3.3.8 Soundscapes

3.3.8.1 Affected Environment

Natural soundscapes are comprised of the natural sound conditions in a park that exist in the absence of any human-produced noises. These conditions are actually composed of many natural sounds, near and far, which often are heard as a composite, not individually. Natural sound conditions include the sounds of ocean waves, blowing wind, chirping birds, insects, and many other sounds found in nature, including at times complete silence. The opportunity to experience the Seashore's natural soundscape unimpaired by the sounds of human civilization is an important part of the overall visitor experience, especially as it contributes to the solitude and wilderness experience.

Acoustic readings recorded for the Travel Management Plan were collected at six sites across the Seashore (NPS 2009b). The data found the daytime noise levels across the island range from 35–70 decibels (dBA) depending upon exact location on the island and time of day (NPS 2009b). The range of human hearing extends from about zero dBA for young healthy ears that have not been exposed to loud noise sources to about 140 dBA. When sounds exceed 110 dBA, there is a potential for hearing damage even with relatively short exposures. In quiet suburban areas far from major freeways, the noise levels during the late night hours will drop to about 30 dBA. Outdoor noise levels lower than this only occur in isolated areas where there is a minimum of natural noises, such as leaves blowing in the wind, crickets, or flowing water.

Throughout Cumberland Island the natural soundscape may be affected by industrial and military facilities to the south and west, persistent mid and low level aircraft overflights, vessel traffic on the

waterways surrounding the island, the light island road traffic, and day-to-day human activities associated with the park administration and residence settings.

Noise has the potential to impact both humans and wildlife. For humans, noise could affect recreational experiences and enjoyment of natural environments. For wildlife, noise may disrupt activities such as hunting, breeding, and nesting. This is of particular concern with sensitive, threatened and endangered species.

3.3.8.2 Methodology and Intensity Threshold

The methodology used to assess noise impacts is consistent with NPS *Management Policies 2006* and DO–47: *Soundscape Preservation and Noise Management*. Soundscape impacts were evaluated based on anticipated noise levels generated by fire program activities. The thresholds of change for the intensity of an impact are defined as follows:

Negligible: The natural soundscape would not be affected or the impacts would be so slight that it would not be of any measurable or of perceptible consequence.

Minor: Impacts on the natural soundscape would be detectable, but the change would be small, localized, and of little consequence to visitor experience. Mitigation measures, if needed to address adverse effects, would be simple and successful.

*Moderate***:** Impacts on the natural soundscape would be readily detectable and at the local level. Mitigation measures, if needed to address adverse effects, would be minimal, but may not eliminate adverse effects.

*Major***:** Impacts on the natural soundscape would have substantial consequences to visitor experience or to biological resources in the region. Extensive mitigation measures would be needed to address any adverse effects, and their success would not be guaranteed.

Duration:

*Short-term***:** Effects lasting for the duration of the project.
Long-term: effects lasting for more than the duration of the project.

3.3.8.3 Analysis of Alternatives and Impacts on Soundscape Resources

Impacts of Alternative 1: No Action Alternative

Under this alternative, the Seashore fire management program would be limited to wildfire suppression activities. The use of fire suppression equipment, including but not limited to fire pumps, chainsaws, fire crews with hand tools, helicopter and fixed wing aircraft, support boats, dozers (rare), brush engines, vehicle traffic on park roads or other equipment would increase noise levels near the wildfire project. The "burning" noise from wildfires is considered a natural sound. Equipment to be used for fire suppression activities would generate approximately 80 dBA for fire pumps to 120 dBA for chainsaws (Federal Interagency Committee on Noise 1992). This range exceeds the ambient noise level for the Seashore (35–70 dBA). However, this equipment would

cause a temporary increase in noise level and be limited to the wildfire area. In addition, the associated sound would dissipate quickly with distance (approximately half the noise level per doubling of distance), and variations in vegetation and topography would also minimize sound impacts with distance. The use of aircraft for fire management and suppression activities would impact noise levels throughout the Seashore, but the Seashore would explore options for the use of quiet aircraft technologies to mitigate these impacts. As far as Seashore visitors are concerned, their presence would be absent or minimal from near the work area during a wildfire incident. The effects of the No Action Alternative on natural soundscapes would therefore be short-term, minor to moderate, localized, and adverse due to noise from fire suppression activities.

Cumulative Impacts

Cumulative effects to soundscapes would result from actions described under Alternative 1, plus other disturbances from park operations, commercial air flights over the park, motorized vehicle use in and around the park, industry and military operations south and west of the island, and vessel traffic on the waterways surrounding the island. These actions could cause sound levels in the Seashore to rise, but in limited areas for short periods that rarely impact visitor's enjoyment of the Seashore; visitor presence at the Seashore would expect to be less during wildfires, depending on size and location of the incident. Overall, impacts of actions under Alternative 1, combined with other actions that could affect soundscapes, would result in minor, adverse cumulative effects to natural soundscapes.

Conclusion

The effects of the No Action Alternative on natural soundscapes would be short-term, minor to moderate, localized, and adverse due to noise from fire suppression activities. Cumulative impacts would be minor, adverse cumulative effects to natural soundscapes.

Impacts to Alternative 2: Preferred Alternative

Natural soundscape impacts from wildfire suppression would be the same as Alternative 1. However, wildfires managed for resource objectives under this alternative, over time, would likely have less soundscape impact over larger areas than Alternative 1 as there would likely be decreased intense fire control work by firefighters, as they would take better advantage of pre-prepared wilderness firelines, weather changes, and natural barriers, when possible to eventually control wildfires. Thus, there would likely be less use of dozers and the loudest equipment, decreasing the potential impacts from fire suppression efforts. Preparation for wildland fire managed for resource objectives would be minimal, often related to firelines prepared for prescribed burns (see below paragraph).

The activities associated with prescribed burns and mechanical treatments would involve the use of tools (e.g., chainsaws, masticator, helicopter for prescribed burns) for several days or weeks in specific locations. The use of prescribed burns and mechanical treatments would increase the potential for noise impacts to visitors using the surrounding lands, however visitation would be temporarily limited near the project areas so nearby visitors would be less. These noise impacts would be minimized by limiting the scope, area, and timing of mechanical equipment used for fire management activities. Herbicide treatment would have negligible human generated noise associated with the restricted use and limited applications. Noise from prescribed burning related control

activities, including fireline preparation, would have minor, short-term, site-specific adverse impacts to natural soundscapes and visitor experience. Mechanical vegetation treatments would have minor, short-term, site-specific adverse impacts.

Cumulative Impacts

Cumulative effects to soundscapes as a result of the Preferred Alternative, plus other disturbances from park operations, commercial and military air flights over the park, motorized vehicle use in and around the park, industry and military operations south and west of the island, and vessel traffic on the waterways surrounding the island would be short-term, minor, localized, and adverse. These actions would cause noise levels in the Seashore to increase, but in limited areas for short periods that would rarely impact enjoyment of the Seashore during the entire duration of a visit; visitor presence at the Seashore would expect to be less during wildfires, depending on size and location of the incident, and reduced in the immediate area of prescribed burns and mechanical projects. Overall, impacts of actions under the Preferred Alternative, combined with other actions that could affect soundscapes, would result in minor, adverse, cumulative effects to Seashore soundscapes.

Conclusion

Noise from wildfire managed for resource objectives and prescribed burning, including preparation, would have minor, short-term, site-specific adverse impacts to natural soundscapes. Mechanical vegetation treatments would have minor, short-term, site-specific adverse impacts. Cumulative Impacts would be minor, adverse, cumulative effects to Seashore soundscapes.

Impacts to Alternative 3: No Mechanical Treatments in Wilderness

Soundscape impacts would be the same as Alternative 2, except no mechanical treatments would be conducted in the Wilderness. No mechanical treatments would make reduction of hazardous fuels more problematic and less effective in the wilderness. This would hinder prescribed burns and wildfires managed for resource objectives, likely leading to higher and more intense wildfires harder to manage/suppress within the wilderness than Alternative 2. Increased potential for higher and more intense wildfires would increase fire suppression efforts and associated noises. Depending on the location, size, intensity, and timing of future wildfires suppression efforts could take hours to days to manage and suppress. Eliminating mechanical in Wilderness would likely shift some of the mechanical work to potential firelines outside the Wilderness, such as the Main Park Road, and increase the mechanical work (and noise) in that corridor. Because the Seashore Wilderness is relatively small, this would have comparable noise impacts to the east edge of Seashore Wilderness, and have more impacts to a higher visitation area, the Main Park Road. This would lead to increased noise impacts from fire crews and fire suppression equipment compared to Alternative 2. Noise from potential increased fire suppression activities would be short-term, minor to moderate, localized, and adverse and could reduce enjoyment of visitor experience in the Wilderness and non-wilderness visitors on the Main Park Road area.

Cumulative Impacts

Cumulative effects to soundscapes would result from actions described under Alternative 3, plus other disturbances from park operations, commercial and military air flights over the park, motorized

vehicle use in and around the park, industry and military operations south and west of the island, and vessel traffic on the waterways surrounding the island. Prescribed burns and wildfire managed for resource objectives could cause sound levels in the Seashore to increase, but in limited areas for short periods that rarely impact visitor's enjoyment of the Seashore. Increase potential for more intense and higher wildfires would cause sound levels to increase above the natural ambient level for hours to days depending on the location, size, intensity, and timing of the wildfire. Overall, impacts of actions under Alternative 3, combined with other actions that could affect soundscapes, would result in minor to moderate, adverse cumulative effects to natural soundscapes.

Conclusion

Noise from potential increased fire suppression activities would be short-term, minor to moderate, localized, and adverse and could reduce enjoyment of visitor experience in the Wilderness including their experience of solitude and a primitive, unconfined experience and the non-wilderness visitors on the Main Park Road area. Cumulative impacts would be minor to moderate, adverse cumulative effects to natural soundscapes.

3.4 Cultural Resources

3.4.1 Archaeological and Historic Structure Resources

3.4.1.1 Affected Environment

In addition to the natural diversity of the Seashore, the park preserves a unique cultural record of prehistoric and historic sites. An archaeological inventory of the entire Seashore was completed in 1975–1976 by the Southeastern Archaeological Center. A number of archeological sites, primarily on the sound side of the island, are located in natural and historic zones (as delineated in the Seashore's 1984 General Management Plan). Seventeen archeological sites and two archeological districts are listed or are eligible for listing on the National Register of Historic Places (NRHP). Considerable evidence remains of Indian occupation at the Seashore, from the late Archaic period until European settlement, with shell middens being the most conspicuous pieces. Spanish, French Huguenot, and British explorers and settlers later used and/or occupied the island, with some establishing missions and/or forts of which limited remains have been found. Prior to the Civil War, cotton and rice were raised on island plantations such as Stafford. After the Civil War, the island became a private retreat for prominent industrialists.

Historic structures on the island date from the early plantation era on through the estate/retreat period, with the prominent remaining features being three large mansions and the ruins of a fourth. The Seashore has five historic districts—Dungeness, Stafford Plantation, Plum Orchard, High Point-Half Moon Bluff, and Greyfield (private land)—of which all are listed on the NRHP. Also listed on the NRHP are Main Road as well as Rayfield and Table Point Archeological Districts. In the Dungeness Historic District, the Tabby House, constructed around 1800 during the Greene-Miller period, is the oldest standing structure on the Island. An additional nineteen frame and/or stucco buildings in the Dungeness Historic District are receiving either preservation or adaptive restoration treatment. Portions of the grounds surrounding these structures are mowed to maintain their historic character. Additional areas are being cleared of encroaching vegetation to restore the historic landscape and to protect the structures from wildfire.

The historic structures in the Stafford Historic District includes a large mansion with associated outbuildings as well as 26 tabby brick chimneys that are the remnants of slave cabins and are now in various conditions from ruin to standing. There are an additional eighteen chimneys at the Rayfield Archeological District that remain from that plantation site, with only one still standing. A portion of the Stafford plantation fields are mowed to maintain the historic scene. Part of the Stafford Historic District is NPS land, part is held under a reserved estate agreement, and part is held as private property.

At Plum Orchard, a 35 room, two-story mansion is under NPS jurisdiction and visitor tours are conducted daily. Most of the support structures—residential, garages and storage sheds—are held in reserved estates. The grounds are mowed to maintain their historic character.

The historic structures at Greyfield are privately owned and most structures are protected from wildfire by large maintained lawns. Currently, palmettos, potential hazardous fuels, are growing in close proximity to some structures.

The High Point–Half Moon Bluff Historic District contains two primary communities: High Point and The Settlement. The High Point area began as a hotel/resort development in the late 1800's and eventually became a vacation retreat for the Candler family. The family now holds the property under a reserve estate agreement and it includes nine residential structures as well as outbuildings. The structures are set on a well maintained lawn but, the area around the property has a long history of fire activity.

The Settlement area includes remnants of houses constructed by descendants of freed slaves and a cemetery that contains the graves of early residents of the island, primarily from the north end. The First African Baptist Church, located in the center of the community, is the second church constructed by the congregation; the original log church was built in 1893, and the present frame structure in 1937. Some of the structures within the settlement are on a reserved estate property as are structures (non-historic) on three other tracts located just to the east on Halfmoon Bluff. Vegetation within 200 feet of these structures is being managed to preserve qualities of the historic landscape and to protect the structures from wildfire. The Main Road and North Cut Road are maintained to provide for administrative and resident access, to provide escape routes to residents during wildfires, and to possibly be used as a firebreak for fire control.

A number of other important and historical features such as cemeteries, gardens, service and support buildings, and plantings are located throughout the island and vegetation around them would be managed to protect them from wildfire. The Greene-Miller and Carnegie cemeteries are located near Dungeness, Robert Stafford is buried just south of the Stafford mansion, and Peter Bernardey is buried at Plum Orchard. Many early residents of the island are buried at Cumberland (Halfmoon Bluff) Cemetery.

3.4.1.2 Methodology and Intensity Threshold

The methodology used for assessing archaeological resource impacts included using available GIS data and literature to identify the archaeological resources present and identifying the potential effects to archaeological and historic resources by the action alternatives. The thresholds of change for the intensity of an impact are defined as follows:

*Negligible***:** Impact is at the lowest levels of detection, barely measurable, with no perceptible consequences, either adverse or beneficial. For the purposes of Section 106, the determination of effect would be no adverse effect to archaeological or historic structure resources.

Minor: Disturbance of an archeological site(s) or historic structure(s) is confined to a small area with little, if any, loss of important information potential. For purposes of Section 106, the determination of effect would be no adverse effect.

Moderate: Disturbance of an archeological site(s) or historic structure(s) would not result in the loss of integrity. For purposes of Section 106, the determination of effect would be adverse effect.

Major: Disturbance of an archeological site(s) or historic structure(s) is substantial and results in the loss of most or all of the site and its integrity. For purposes of Section 106, the determination of effect would be adverse effect.

Duration:

Short-term: Any disturbance to archaeological or historic structure resources would be permanent, and are considered long-term.
Long-term: Any disturbance to archaeological or historic structure resources would be permanent, and are considered long-term.

3.4.1.3 Analysis of Alternatives and Impacts on Archaeological and Historic Structure Resources

Impacts of Alternative 1: No Action Alternative

Under this alternative, the Seashore fire management program would be limited to wildfire suppression actions. The inability to use proactive vegetation management tools could reduce the number of acres created/maintained for defensible space and restored successfully, thus brush density would continue to increase leading to more buildup of fuels in areas adjacent to archaeological and historic resources. This could lead to increased potential for more intense wildfires that are difficult to suppress/manage and direct fire impact on archaeological sites and/or historic structures. Potential for increased high intensity wildfire could result in the destruction of unknown, unrecorded, and known archaeological sites. Severe wildfire impacts include discoloration of surface artifacts, burning perishable materials, and checking or cracking of rock and ceramic artifacts. Archeomagnetic dates and pollen counts could also be altered from a severe, uncontrollable wildfire. Depending on severity of the fire, historic structures could be degraded by charring of wooden structures or spalling of cement based structures, which appears as distinct lines or striations resulting in cracking, breaking, chipping, or craters on the surface (USFS 2012). This effect to archaeological and historic structure resources would be direct, long-term, minor to moderate, adverse, and localized due to potential fuel build up and the increased risk for severe wildfires.

Wildfire suppression tactics could result in direct, long-term, adverse, localized impacts due to displaced surface materials; exposure of materials due to ground disturbance associated with the activities; or to disturb materials immediately below the surface with vehicle use due to earth moving or compaction. Indirect adverse impacts would include exposure of artifacts to erosion. With

avoidance of known archeological and historic structure resources and implementation of mitigation actions, the direct and indirect adverse impacts of fire suppression tactics would be localized, short-term, and minor.

Cumulative Impacts

Cumulative impacts to archeological and historic structure resources would occur from No Action Alternative plus other activities including past development, park management activities, past logging activities and grazing, and natural erosion. The No Action Alternative would result in indirect, minor to moderate, long-term, adverse, site-specific impacts as well as direct, minor, adverse, long-term, and localized effects due to potential future severe wildfires from continued increase of brush density and ground fuels, lack of creation/maintenance of defensible space, and potential fuel buildup in areas adjacent to archaeological and historic structure resources.

Conclusion

Impacts to archaeological and historic structure resources from limiting the fire program to presently approved fire management activities could be direct, minor to moderate, long-term, adverse, and localized due to potential future severe wildfires from continued increase of brush density, reduced creation/maintenance of defensible space, and potential fuel buildup in areas adjacent to archaeological and historic structure resources. Cumulative impacts to archaeological resources under this alternative would be direct, minor to moderate, long-term, adverse, and localized.

Impacts to Alternative 2: Preferred Alternative

Archaeological and historic resource impacts from wildfire suppression actions under this alternative would be the same as the No Action Alternative; however, prescribed burns and wildfires managed for resource objectives, mechanical and manual treatments, and targeted herbicide application would be used as proactive vegetation management tools in combination with wildfire suppression. The use of proactive vegetation management tools would increase the ability and efficiency to reduce brush density and ground cover and to maintain/create defensible space, thus increasing the reduction of hazardous fuels and success rate of ecological restoration efforts to fire-adapted and other unique habitats. This would increase the potential for lower intensity ground fires, which are easier to manage/suppress, thus reducing the potential risk of damage to archaeological and historic resources. Impacts to archaeological and historic structure resources under the Preferred Alternative would be direct, minor to moderate, beneficial, long-term, and localized due to minimizing the potential for future severe wildfires as the amount of acres restored and defensible space increases and brush density decreases.

Prescribed fire would allow for advance clearance and mitigation activities at cultural resource sites. Known archaeological and historic resources could be excluded from prescribed burn units or local site- specific related mitigation measures could be implemented. Prescribed burning and wildfires managed for resource objectives would reduce the probability of severe wildfires, thus reducing the potential for damage to known and unknown archaeological and historic resources, thus enhancing protection. Standard management strategies would be adopted to preclude or minimize impacts. Should new archaeological resources be identified during prescribed burns, all work would cease in the immediate vicinity of the discovery until the resource could be identified and documented and an

appropriate mitigation strategy developed in consultation with the State Historic Preservation Officer. Any known archaeological resources would be marked with special flagging and mitigation measures would be taken to protect identified resources from prescribed burns. Based upon current information, the Preferred Action Alternative impacts would be direct, minor to moderate, long-term, beneficial, and site-specific by helping to maintain the archaeological and cultural resources.

Mechanical and manual hazardous fuel treatments could result in direct, long-term, adverse, localized impacts due to displaced surface materials; exposure of materials due to ground disturbance associated with the activities; or to disturb materials immediately below the surface with vehicle use due to earth moving or compaction. Indirect adverse impacts would include exposure of artifacts to erosion. With avoidance of known archeological resources and implementation of mitigation actions, the direct and indirect adverse impacts of mechanical and manual treatments would be localized, short-term, and minor.

Targeted herbicide application would be applied to specific basal or foliar plant areas, which would minimize chances for overspray and migration into the soil. Thus, impacts would be negligible.

Cumulative Impacts

Cumulative impacts to archeological and historic structure resources would occur from No Action Alternative plus other activities including past development, park management activities, past logging activities and grazing, and natural erosion. The Preferred Alternative would result in direct, minor to moderate, long-term, beneficial, site-specific impacts to archeological and historic structure resources by minimizing the potential for future severe wildfires as the acres of successful ecological restoration efforts and defensible space increases and brush density decreases.

Conclusion

Effects on archaeological and historic resources from the Preferred Alternative would be direct, long-term, minor to moderate, beneficial, site-specific effects by helping to maintain archaeological and historic structure resources. With avoidance of known archeological resources and implementation of mitigation actions, the direct and indirect adverse impacts of mechanical and manual treatments would be localized, short-term, and minor. Cumulative impacts to archaeological and historic structure resources under this alternative would be direct, minor to moderate, long-term, beneficial, and localized.

Impacts to Alternative 3: No Mechanical Treatments in Wilderness

Archaeological and historic structure impacts under this alternative would be the same as Alternative 2; however, no mechanical treatments would occur in the Wilderness area. This would make reduction of hazardous fuels less effective in the Wilderness. The lack of fuel breaks would hinder prescribed and wildfire managed for resource objectives, likely leading to higher and more intense wildfires harder to manage/suppress within and adjacent to the Wilderness than Alternative 2. Due to potential fuel build up, the potential for more intense and larger wildfires would be higher and could increase the potential risk of damage to archaeological and historic structure resources in and adjacent to the Wilderness. The degree of impacts would vary depending on size of the fire, the

location, extent, timing, and other factors related to the fire. Impacts would be adverse, minor, long-term, site-specific and localized in and adjacent to the Wilderness due to no mechanical treatments.

Cumulative Impacts

Cumulative impacts to archeological and historic structure resources would occur from Alternative 3 plus other past activities including development, park management activities, logging activities and grazing, and natural erosion. Due to the continued absence of mechanical treatments in wilderness and a resulting lack of fuel breaks and barriers to stop wildfires, Alternative 3 would have an increased potential for wildfires to become large and intense in the Wilderness, and increased potential for damage from associated fire-suppression activities. Cumulative impacts to archaeological and historic structure resources under this alternative would be direct, minor to moderate, long-term, adverse, and localized.

Conclusion

Impacts would be adverse, minor, long-term, site-specific and localized in and adjacent to the Wilderness due to no mechanical treatments. Potential risk of damages to archaeological and historic structure resources from more intense wildfires would increase over Alternative 2.

3.4.2 Cultural Landscapes

3.4.2.1 Affected Environment

Cultural landscapes are “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 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 (DO-28)." There are five NRHP historic districts (Dungeness, High Point-High Moon Bluff, Plum Orchard, Stafford Plantation, and Greyfield (privately owned)) with cultural landscapes that reflect in varying degrees the utilization by the Native American culture, the plantation era, the transition from slavery to freedom for African Americans, and the resort era. Each historic district is described in the Archaeological and Historic Structures Resources (Section 3.4.1).

The Seashore cultural landscapes have been significantly altered by later human activities and decades of neglect and fire suppression resulting in encroaching vegetation growth that may presently reduce the integrity and aesthetic value of the cultural resource.

3.4.2.2 Methodology and Intensity Threshold

The methodology used for assessing archaeological resource impacts included using available literature to identify the historic resources present and identifying the potential effects to historic resources by the Proposed Action. The thresholds of change for the intensity of an impact are defined as follows:

Negligible: Impact is at the lowest levels of detection, barely measurable, with no perceptible consequences, either adverse or beneficial. For the purposes of Section 106, the determination of effect would be no adverse effect to cultural landscapes.

Minor: Disturbance of a cultural landscape(s) is confined to a small area with little, if any, loss of important information potential. For purposes of Section 106, the determination of effect would be no adverse effect.

Moderate: Disturbance of the cultural landscape(s) would not result in the loss of integrity. For purposes of Section 106, the determination of effect would be adverse effect.

Major: Disturbance of the cultural landscape(s) is substantial and results in the loss of most or all of the site and its integrity. For purposes of Section 106, the determination of effect would be adverse effect.

Duration:

Short-term: Any disturbance to cultural landscapes would be permanent, and are considered long-term.
Long-term: Any disturbance to cultural landscapes would be permanent, and are considered long-term.

3.4.2.3 Analysis of Alternatives and Impacts on Cultural Landscapes

Impacts of Alternative 1: No Action Alternative

Under this alternative, the Seashore fire management program would be limited to wildfire suppression. The inability to use proactive vegetation management tools would reduce defensible space created and/or maintained around historic structures and sites, and the number of acres restored successfully, thus allowing the continued retention and increased density of hazardous fuels within and adjacent to cultural landscapes. This could lead to increased potential for larger and more intense wildfires that are difficult to suppress/manage and increased stand replacing vegetation loss and soil compaction from ground disturbances of fire suppression activities. Fires or damage from suppression activities could result in unacceptable changes to character-defining elements of historic districts or structures. Fires could also remove important landscape elements, structures or historic sites, and create large amounts of unsightly burned and scorched vegetation, and unvegetated areas from fire lines and or intense burning. These potential impacts would diminish the visual integrity of the cultural landscape. Effects on associated buildings and structures would be the same as discussed above under the analysis of No Action on Archaeological and Historic Structures. Wildfire suppression could also lead to reduced integrity of a cultural landscape as palmettos and brush continues to encroach on the cultural landscapes. This effect would be direct and indirect, short- to long-term, minor to moderate, adverse, localized due to continued retention and increased density of hazardous fuels within and adjacent to cultural landscapes and the increased risk for severe wildfires. The intensity of impacts would depend on the intensity, duration, and location of the fire, and the mitigation efforts that could be implemented.

Cumulative Impacts

Cumulative effects to cultural landscapes would result from actions described under Alternative 1, plus other disturbances from measures taken by private residents and state agencies to reduce hazardous fuels. These actions combined with the No Action Alternative would result in minor to moderate, adverse cumulative impacts to cultural landscapes, due to the increased risk of uncontrolled wildfire, vegetation loss, and soil or ground disturbance. Increased potential for uncharacteristic wildfires is due to the retention and continued increase of hazardous fuels within and adjacent to cultural landscapes.

Conclusion

No Action impacts would be direct and indirect, short- to long-term, minor to moderate, adverse, localized due to continued retention and increased density of hazardous fuels within and adjacent to cultural landscapes and the increased risk for severe wildfires. The intensity of impacts would depend on the intensity, duration, and location of the fire, and the mitigation efforts that could be implemented. Cumulative impacts would be minor to moderate, adverse to cultural landscapes.

Impacts to Alternative 2: Preferred Alternative

Wildfire Suppression impacts to cultural landscapes under this alternative would be the same as the No Action Alternative; however, prescribed burns and wildfires managed for resource objectives, mechanical and manual treatments, and targeted herbicide application would be used as proactive vegetation management tools in combination with wildfire suppression.

The use of proactive vegetation management tools would increase the ability and efficiency to reduce brush density and ground cover and to maintain/create defensible space, thus increasing the reduction of hazardous fuels and success rate of ecological restoration efforts to fire-adapted and other unique habitats. This would increase the potential for lower intensity ground fires, which are easier to manage/suppress, thus reducing the potential risk of damage to cultural landscapes and associated historic resources. These lower intensity ground fires may help maintain more open cultural landscapes. In addition, the proactive vegetation management actions in this alternative would be planned and designed to complement cultural landscape objectives. Impacts to cultural landscape sunder the Preferred Alternative would be direct, minor to moderate, beneficial, long-term, and localized due to minimizing the potential for future severe wildfires as the amount of acres restored and defensible space increases and brush density decreases.

Prescribed fire would allow for advance clearance and avoidance and mitigation activities in cultural landscapes. Prescribed burning would be used to reduce the risk of brush encroachment and to enhance cultural resources important to the cultural landscapes (e.g., maintaining open fields where rice and cotton were grown, improving and creating defensible space around structures) and visual aesthetics, thus decreasing the probability of severe wildfires and enhancing their protection. Any known archaeological resources would be marked with special flagging and mitigation measures would be taken to protect identified resources from prescribed burns. Based upon current information, the Preferred Action Alternative impacts would be direct, minor to moderate, long-term, beneficial, and site-specific by helping to maintain cultural landscapes.

Wildfires managed for resource objectives would have similar impacts as described for wildfire suppression under the No Action Alternative, except that the wildfires managed for resource

objectives would have prescriptive elements such as avoiding managing fires for resource benefit during periods of highest fire danger, thus avoiding the larger, stand replacing, intense burns that may become characteristic under Alternative 1. Effects on buildings and structures would be less than that as discussed above under the analysis of the No Action Alternative on Archaeological and Historic Structure Resources. Fires would not be managed without adequate protection and mitigations to historic and cultural sites. Due to vegetation management actions in this alternative, over time the probability of large and intense stand replacing fires would decrease. Impacts to vegetation would be negligible to moderate short-term adverse and long-term beneficial changes in area landscapes, including scenic quality and ecosystem processes, depending on the location, timing, extent, and severity of the wildfire managed for resource objectives.

Manual and mechanical treatments would have negligible to minor effects on landscaped vegetation characteristics around historic structures. These effects could consist of minor trimming or vegetation removal around structures in an effort to create and/or maintain defensible space. Historic plantings would not be removed.

Targeted herbicide application would be applied to specific basal or foliar plant areas, which would minimize chances for overspray and migration into the soil. Thus impacts would be negligible to cultural landscapes, which in most cases is complementary to cultural landscapes once the project is completed.

Cumulative Impacts

Cumulative effects to cultural landscapes would result from actions described under the Preferred Alternative, plus other disturbances from measures taken by private residents and state agencies to reduce hazardous fuels. These actions combined with the Preferred Alternative would result in direct, minor to moderate, long-term, beneficial, site-specific impacts by minimizing the potential for future severe wildfires as the acres of successful ecological restoration efforts and defensible space increases and brush density decreases.

Conclusion

Impacts under the Preferred Action Alternative would be direct, minor to moderate, long-term, beneficial, and site-specific by helping to maintain cultural landscapes. Cumulative impacts would be direct, minor to moderate, long-term, beneficial, site-specific impacts by minimizing the potential for future severe wildfires as the acres of successful ecological restoration efforts and defensible space increases and brush density decreases.

Impacts to Alternative 3: No Mechanical Treatments in Wilderness

Cultural landscape impacts under this alternative would be the same as Alternative 2; however, no mechanical treatments would occur in the Wilderness. This would make reduction of hazardous fuels less effective and more problematic in the Wilderness. The lack of fuel breaks to help stop fires would hinder prescribed burns and wildfire managed for resource objectives, likely leading to higher and more intense wildfires harder to manage/suppress within and adjacent to the Wilderness than Alternative 2. Due to potential fuel build up, the potential for more intense and larger wildfires would increase, which could increase the potential risk of damage by severe wildfires to cultural landscapes and associated historic resources adjacent to the Wilderness. The degree of impacts

would vary depending on size of the fire, the location, extent, timing, and other factors related to the fire. Impacts would be adverse, minor, long-term, site-specific and localized due to no mechanical treatments in the Wilderness.

Cumulative Impacts

Cumulative effects to cultural landscapes would result from actions described under this alternative for no mechanical in the Wilderness, plus other disturbances from measures taken by private residents and state agencies to reduce hazardous fuels. Due to no mechanical treatments in wilderness, resulting in a lack of fuel breaks and barriers to stop wildfires, Alternative 3 would have an increased potential for large and intense wildfires burning cultural landscapes. Associated fire-suppression activities such as vegetation cutting, clearing, and altering (e.g., dozer use, hand line construction, burnouts) would be more likely to alter the cultural landscape. Cumulative impacts to cultural landscapes under this alternative would be direct, minor to moderate, long-term, adverse, and localized.

Conclusion

Impacts for Alternative 3, No mechanical in Wilderness, would be adverse, minor, long-term, site-specific and localized due to no mechanical treatments in the Wilderness. Potential risk of damages to cultural landscapes from more intense wildfires would increase over Alternative 2.

3.5 Human Resources

3.5.1 Visitor Use and Experience

3.5.1.1 Affected Environment

Total visitation to the Seashore and NPS facilities in St. Marys during the period of 1976 to 2012 was approximately 1,611,800 with approximately 61,490 in 2012 alone (NPS 2013b). On average, forty to fifty thousand visitors visit the island annually (NPS 2003) with March through May having the highest visitation (NPS 2013b). The Seashore is only accessible by a concession-operated passenger ferry from St. Mary's that operates seven days a week, except December through February when it runs every day but Tuesdays and Wednesdays. A maximum of approximately 300 tourists are allowed per day in accordance with the 1984 General Management Plan and overnight campers are limited to seven nights. The island has little infrastructure for large-scale tourism. There are no stores or restaurants, and only a small inn on private land. Visitors are not allowed to bring vehicles and roads and trails are not paved. The roads are used by NPS vehicles, tour vans, and island residents. Visitor activities are concentrated at the southern end of the island, although the NPS has recently instituted van tours to some features on the north end of the island.

Visitors come to the island to recreate on the undeveloped beach, walk the picturesque primitive roads and trails lined with live oaks, observe the feral, free roaming horses and other wildlife, visit the ruins of the Dungeness mansion, and tour the historic Plum Orchard mansion. The Seashore maintains three primary developed visitor use areas—Sea Camp, Dungeness, and Plum Orchard and northern historic sites.

The Sea Camp area includes a public boat dock, a small visitor contact station with exhibits, presentation room, and offices for rangers; a 16-site campground with restroom and shower facilities plus two group sites; an over-the-dune boardwalk; and some operational support utilities.

The Dungeness area contains a public boat dock, the Ice House Museum, historic structures and features of the former Carnegie estate, NPS support facilities and housing, marsh and dune boardwalks, and wildlife viewing areas. There are also ranger-led NPS walking tours of the Historic District.

Plum Orchard has another public boat dock, the historic mansion with NPS walking tours, and a nearby camping area that supports the public hunts and other activities. Further north on the island are The Settlement and the first African Baptist Church.

Common visitor activities include bird and wildlife watching, hiking, swimming, bicycling, camping (developed and backcountry), backpacking, kayaking, fishing, hunting (special restricted season), and beachcombing. There are four primitive/backcountry camping areas located in the central and northern portion of the island and a 50-mile trail network that covers the full extent of the island. Hunting is permitted on the island during six managed hunts that are open to the public and held during the State of Georgia's hunting seasons. The hunts are advertised in newspapers, and a lottery drawing is held to select participants.

3.5.1.2 Methodology and Intensity Threshold

The methodology used for assessing visitor use and experience impacts included identifying the potential effects to visitor use by the action alternatives. The thresholds of change for the intensity of an impact are defined as follows:

Negligible: Visitors would not be affected or changes in visitor use and/or experience would be below or at the level of detection. Any effects would be short-term. The visitor would not likely be aware of the effects associated with the alternative.

Minor: Changes in visitor use and/or experience would be detectable, although the changes would be slight and likely short-term. The visitor would be aware of the effects associated with the alternative, but the effects would be slight.

Moderate: Changes in visitor use and/or experience would be readily apparent and likely long-term. The visitor would be aware of the effects associated with the alternative, and would likely be able to express an opinion about the changes.

Major: Changes in visitor use and/or experience would be readily apparent and have substantial long-term consequences. The visitor would be aware of the effects associated with the alternative, and would likely express a strong opinion about the changes.

Duration:

Short-term: Impacts that generally last less than one year and would affect only one season's use by visitors.

Long-term: Impacts that generally last more than one year and would be more permanent in nature.

3.5.1.3 Analysis of Alternatives and Impacts on Visitor Use and Experience

Impacts of Alternative 1: No Action Alternative

Under this alternative, the Seashore fire management program would be limited to wildfire suppression activities. The inability to use more active vegetation management activities including prescribed burning, wildfire managed for resource objectives, mechanical and manual equipment use on vegetation, and targeted herbicide use would reduce the ability (i.e., reduced acreage) and efficiency to restore fire-adapted ecosystems; to reduce hazardous fuels and maintain defensible space; and to restore fire as a natural ecological process to the landscape. This would result in the continued retention and increase of fuel buildup in the Seashore as brush density, ladder fuels, and dead and down fuels continue to increase. This leads to increased potential for larger and more intense wildfires that are difficult to suppress/manage. These wildfires could require more frequent public use restrictions as increased suppression efforts and smoke emissions would negatively impact the experience of visitors using other areas of the Seashore or surrounding lands and passenger ferry operations. Depending on the wildfire severity and size, this could remove large tracts of vegetation changing the island natural environment and scenery, reducing the quality of the visitor experience. This effect would be direct, short- to long-term, minor to moderate, adverse, and localized due to potential increased fuel build up and risk for severe wildfires. In addition, allowing the accumulation of thick underbrush could also restrict access to areas within the Seashore.

Cumulative Impacts

Cumulative impacts to visitor use and experience under the No Action would be adverse, long-term, and minor due to increased potential for uncharacteristic wildfires as brush density and ground cover continue to increase. This would also result in increased potential for public use closures or smoke impacts due to fire or fire suppression activities.

Conclusion

Impacts to visitor use would be long-term, minor, localized, and adverse due to public use closures from fire potential and associated fire suppression tactics; increased potential for stand replacing wildfires that could change forested areas to brush habitat or loss of live oak habitat.

Impacts to Alternative 2: Preferred Alternative

Under Alternative 2, prescribed burns, managed wildfires, manual, and/or mechanical treatments, and targeted herbicide use would be used as additional management tools coupled with wildfire suppression tactics found under Alternative 1. The use of proactive vegetation management tools would increase the ability and efficiency to reduce brush and ground cover density; maintain/create defensible space and fuel breaks; and reintroduce fire as a natural ecological process. This would result in the increased success rate of ecological restoration efforts to fire-adapted ecosystems and other unique habitats by opening the mid-story and ground cover vegetation layers. Increased ecological restoration would increase the probability for lower intensity ground fires that are easier to manage/suppress and increase growth and germination of native herbaceous plant communities

(grasses, forbs, and wildflowers), which would support native wildlife species. As bird watching is one of the popular recreation activities, the perpetuation of native vegetation communities and native wildlife would enhance native bird species, thus enhancing the visitor experience.

There would be temporary visitor use restrictions in various sections of the Seashore to assure that there are no visitors where vegetation management actions are actively being applied (i.e., prescribed burns and wildfires managed for resource objectives, mechanical treatments, and herbicide application). In the short-term, such restrictions would negatively impact the visitor experience of those people who are prevented from accessing the area. However, areas adjacent to the closures would still be open to visitor use and would have similar resources available**.**

In general, adding proactive vegetation management tools in combination with wildfire suppression tactics will lead to a more diverse and natural area, with less human disturbance, which would be more aesthetically enticing to Seashore visitors.

Prescribed fire, wildfire managed for resource objectives, mechanical and manual hazardous fuel reduction would result in direct adverse impacts due to temporary displacement of some visitor activities (e.g., closure of trails and/or campsites in the vicinity, etc.) during prescribed burn operations, smoke in scenic views, odors, temporary restrictions in access to some areas, and the presence of blacked areas within natural areas. However, these adverse impacts would be localized, short-term, and negligible to minor. The presence of fire, smoke, and blackened areas may present an opportunity for education and interpretation of natural values and processes, which may provide a minor, long-term, beneficial impact. Overall, this alternative would have direct, short-term negligible adverse impacts in the immediate area of treatment during the treatment period and is expected to have direct, minor to moderate, beneficial, long-term, localized impacts by minimizing the potential for future severe wildfires as the amount of area restored increases and fuel hazard reduction increases (i.e., dense brush and ground cover).

Cumulative Impacts

The Preferred Alternative would result in short-term, adverse, and minor cumulative impacts to visitor use and experience and long-term, minor cumulative positive impacts to visitor use and experience. In addition, indirect effects of this alternative would be localized, short-term, minor, and adverse or beneficial due to the educational opportunity to explain natural process and benefits of prescribed fire.

Conclusion

Impacts to visitor use would be short-term, minor, and negative due to public use closures and long-term, minor positive due to the reduced potential for future severe wildfires and the perpetuation of native vegetation communities and associated wildlife that visitors could enjoy.

Impacts to Alternative 3: No Mechanical Treatments in Wilderness

Visitor Use and Experience impacts under this alternative would be the same as Alternative 2; however, no mechanical treatments would occur in the Wilderness. This would make reduction of hazardous fuels less effective in approximately 20,500 acres of the Seashore. The lack of Wilderness fuel breaks would hinder prescribed and wildfire managed for resource objectives, likely leading to

higher and more intense wildfires harder to manage/suppress within and adjacent to the Wilderness than Alternative 2. Due to potential fuel build up, the potential for more intense and larger wildfires would be higher and could require more frequent public use restrictions while fires are being suppressed and smoke generated by those fires would negatively impact the experience of visitors using other areas of the Seashore or surrounding lands. Wilderness natural and cultural resources could be degraded by stand replacing fire, and unique habitats would not be effectively restored and/or maintained with no help from mechanical treatments. The degree of impacts would vary depending on size of the fire, the location, extent, timing, and other factors related to the fire. Impacts would be adverse, negligible to minor, short- to long-term, and localized to the Wilderness due to no mechanical treatments.

Cumulative Impacts

Alternative 3, No mechanical in Wilderness, would have the same impacts as Alternative 2, except that visitor use and experience enjoyment could be further reduced in and adjacent to the Wilderness.

Conclusion

Impacts would be adverse, negligible to minor, short- to long-term, localized to the Wilderness due to no mechanical treatments. Overall, impacts to visitor use and experience would be short-term, minor, and negative due to public use closures and long-term, minor positive due to use of proactive vegetation management tools.

3.5.2 Park Operations

3.5.2.1 Affected Environment

Through congressional appropriation, the Seashore receives an annual budget in support of park operations and administration. The base operating budget in 2013 is $ 2,453,400, with additional funding of approximately $1,394,000 for special park projects. Project funding is used for a variety of park related projects such as new construction; cyclic building maintenance; resource management and restoration work; research; and interpretive projects.

Many previous fires at the Seashore were not recorded in the database, so the Seashore got no "credit" for their occurrence; although, the Seashore is working to get the records correct and up to date. Annual average funding for the Fire Management Program is approximately $6,500 for program operations, with an additional $5,000 for mechanical hazardous fuels reduction projects. Additional fire project and treatment funding is sometimes available, depending on regional and national funding availability and priorities.

Wildfire incident responses are separately funded as they occur through a national fire account managed by the Department of the Interior. These funds have stringent rules and policies as to their use, availability and procedures. These funds may be used for wildfire suppression and/or wildfires managed for resource objectives, but not for prescribed fires which are funded from separate fuels management accounts.

The Seashore Fire Management Officer (FMO), the only full-time fire employee, is funded from regular Park Operations funding, not through fire related funding. He also assists when available at several other NPS units in the area that do not have a FMO. Other members of the park staff in non-fire positions have received fire training and are "red carded", so they may participate in wildland fire management activities as needed. When additional fire personnel are needed at the Seashore for an incident, they are brought in, as needed, from interagency cooperators.

Management Zones

For general management, the Seashore is divided into four land management zones—Development, Historic, Natural, and Other—and Wilderness (subzone of the Natural Zone) as described in the GMP (NPS 1984). The Development Zone consists of visitor services at Sea Camp, Dungeness Area, and Little Greyfield. Sea Camp includes a visitor center with exhibit room and lobby, offices for rangers and interpreters, a 16-site campground (total number of campers limited to 60, with no more than six per site), a bathhouse, an over-the-dune boardwalk, and necessary support utilities. The Dungeness area contains the Ice House Museum and marsh and dune boardwalks and wildlife viewing areas. Little Greyfield consists of four houses used as employee housing and two former reserved estate houses. The development zone is managed to preserve natural features.

The Natural Zone consists of the beaches, sand dunes, marshes, and uplands of oak, pine, and scrub/shrub forests. The management strategy is to preserve important plant communities and wildlife habitat (i.e., waterfowl and loggerhead nesting habitat).

The Wilderness Subzone consists of the 9,886 acres of congressionally designated wilderness and 10,500 acres of potential wilderness. All lands are managed to protect wilderness characteristics and associated values.

The Historic Zone includes five historic districts—Dungeness, Stafford Plantation, Plum Orchard, High Point-Half Moon Bluff—all are listed on the NRHP; Greyfield is privately owned and listed on the NRHP. The management strategy is to preserve all structures in good condition and to document non-preservable structures before they disintegrate, then preserve certain features (e.g., stone foundations).

The Other Zone consists of Little Cumberland Island, which is all privately owned. These properties are managed by the Little Cumberland Island Homeowners Association and are exempt from federal acquisition under an agreement for the preservation of resources of Little Cumberland Island.

The Cumberland Island Visitor Center in St. Mary's, Georgia is open daily from 8:15 a.m. to 4:30 p.m. Seashore facilities are closed on December 25th. Cumberland Island is accessible by private boat or passenger ferry only. Bicycles and kayaks may be transported to the island by an authorized concessionaire charter boat. The passenger ferry operates seven days a week, except December through February when it runs every day but Tuesdays and Wednesdays. It does not transport pets, bicycles, kayaks or cars to the island. Guided tours are provided of the Dungeness Historic District and five to six hour motorized tours are provided of the Seashore, including both natural and cultural sites.

Roads/Trails
There are approximately 55 roads totaling 46 miles and 32 trails totaling 38 miles within the Seashore. Of the 55 roads, approximately 30 are privately owned totaling 7.4 miles. Many of the trails were formerly roads that have been reclaimed by nature. Roads and trails are not paved.

3.5.3.2 Methodology and Intensity Threshold

The methodology used for assessing park operations impacts included identifying anticipated level of effort for fire staff and impacts to other staff generated by fire program activities. The thresholds of change for the intensity of an impact are defined as follows:

Negligible: Park operations would not be effected or the impacts would be so slight that it would not be of any measurable or perceptible consequence.

Minor: Impacts would be detectable, but the change would be small, localized, and of little consequence to park operations. Interagency contacts are aware of the fire management operations and are prepared to respond as a contingency force if needed.

*Moderate***:** Park operations modify their normal routine during the period of fire management activity and interagency firefighting organizations are committed to the activity for the short term.

*Major***:** Park operations are impacted by the fire management activity as a priority, utilizing staff from all disciplines to assist during the period of operation. Interagency firefighting organizations are fully committed to the fire management activity as an emergency responder.

Duration:

Short-term: Impacts that generally last for the duration of the incident, treatment, or project action.
Long-term: impacts that generally last beyond the duration of the incident, treatment, or project action

3.5.3.3 Analysis of Alternatives and Impacts on Public Health and Safety

Impacts of Alternative 1: No Action Alternative

Impacts on park operations would likely occur in the area of staff demand resulting from large wildfire incidents. In the event of such a fire, park operations in other divisions would likely be disrupted by demands relating to traffic control (private residents), closures, restrictions, evacuations, and supporting the wildfire incident management needs. The NPS would provide or be involved in law enforcement activities, possible emergency medical services, fire information services, transporting supplies and personnel, other fire logistics and support, and follow-up maintenance work and Seashore re-opening. Damage from high-severity wildfires in or near developed areas may require long-term closures or restrictions, repairs, (such as landscaping), repair of smoke or fire damage to buildings, roads and trails repair, and sign replacement. It is not unusual for park areas to experience major changes to operations for up to a year, or more, after an incident. After severe wildfires a BAER team is often assigned to the park to help assess, plan for, and fund the operational changes and damages.

During fuels management activities from wildfires, impacts to staff would include increased public outreach and possible augmenting of staff levels to manage the activity. They may be brought in from other areas or may reassign Seashore staff from other duties, but would result in minor, short-term, adverse impacts. Overall, the No Action Alternative would have short-term, minor to major, adverse impacts to park operations because of the increased probability of higher and more intense wildfires.

Cumulative Impacts

Seashore staff that would have to dedicate their time to firefighting or related tasks would not be able to perform their regular duties, representing a minor to moderate adverse, indirect cumulative impact.

Conclusion

Overall, the No Action Alternative would have short-term, minor to major, adverse impacts to park operations because of the increased probability of higher and more intense wildfires. Cumulative impacts would be minor to moderate adverse, indirect.

Impacts to Alternative 2: Preferred Alternative

Under the Preferred Alternative, Seashore staff would help and support the proposed actions, including prescribed burns, wildfires managed for resource objectives, mechanical and manual vegetation treatments, and targeted herbicide use as a follow-up to fuel breaks created by mechanical treatments. However, because of the lack of red-carded personnel on the Seashore staff, most of the work for proposed treatment actions would have to be performed with assistance from a supplemental workforce (i.e., other parks, other agencies, contractors). Duties of Seashore staff could include, but would not be limited to monitoring weather conditions, hand clearing trees and brush, and notifying park neighbors of when and where treatment activities and burning would take place.

As for suppression operations, as in the No Action Alternative, the NPS would provide or be involved in law enforcement activities, possible emergency medical services, fire information services, transporting supplies and personnel, other fire logistics and support, and follow-up maintenance work and Seashore re-opening. Over time, the fuels treatment work outlined in Alternative 2 should result in smaller and less intense wildland fires, which have a lower impact to park operations. Short-term impacts to park operations would be minor to moderate and adverse.

Long-term adverse effects on park operations would be negligible to minor in intensity, resulting from implementation of prescribed fires, wildfire managed for resource objectives, and manual and mechanical fuel reduction and herbicide use. These activities would lower the potential for catastrophic wildfires, which have the potential to severely disrupt park operations. Therefore, over time, park area closures would be less in number and length of time, therefore benefiting visitors, residents, and employees. However, the additional fire management tools would lead to more planning and implementation efforts needed, which could require more fire management personnel, detailed personnel from other units doing short-term directed duties, or contractors.

Cumulative Impacts

The treatments planned within the Seashore's boundaries and cooperative fire planning efforts would reduce the likelihood of a wildfire, which would in turn reduce the potential for the disruption of park operations that would accompany wildfire. Overall, impacts of actions under the Preferred Alternative, in combination with impacts of other actions that could affect park operations, would result in negligible, short- and long-term, adverse, cumulative impacts to park operations.

Conclusion

Short-term impacts to park operations would be minor to moderate and adverse. Long-term adverse effects on park operations would be negligible to minor in intensity, resulting from implementation of more active vegetation management tools. Cumulative impacts would be negligible, short- and long-term, adverse to park operations.

Impacts to Alternative 3: No Mechanical Treatments in Wilderness

Impacts to park operations would be the same as Alternative 2, except that no mechanical treatments would occur in the Wilderness. No mechanical treatments would make reduction of hazardous fuels more problematic and less effective in the Wilderness. This would hinder prescribed burns and wildfires managed for resource objectives, likely leading to higher and more intense wildfires harder to manage/suppress within the Wilderness than Alternative 2. Increased potential for higher and more intense wildfires would increase fire suppression efforts. Increased fire suppression efforts within the Wilderness would have more impacts than Alternative 2. Short-term impacts would be minor to major, adverse impacts to park operations. Long-term adverse effects on park operations would be negligible to minor in intensity, resulting from implementation of more active vegetation management tools.

Cumulative Impacts

The treatments planned outside the Wilderness cooperative fire planning efforts would reduce the likelihood of a large and intense wildfire, which would in turn reduce the potential for the disruption of park operations that would accompany more intense wildfires. The potential increase for higher and more intense wildfires within the Wilderness would increase the potential for Seashore staff that would have to dedicate their time to firefighting or related tasks and not able to perform their regular duties, representing a minor to moderate adverse, indirect cumulative impact. Overall, Alternative 3 actions in combination with impacts of other actions that could affect park operations would result in negligible to minor, short- and long-term, adverse, cumulative impacts to park operations.

Conclusion

Increased potential for higher and more intense wildfires would increase fire suppression efforts. Increased fire suppression efforts within the Wilderness would have the same impacts as described in the No Action Alternative. Short-term impacts would be minor to major, adverse impacts to park operations. Long-term adverse effects on park operations would be negligible to minor in intensity, resulting from implementation of more active vegetation management tools. Increased potential for higher and more intense wildfires within the Wilderness would result in a minor to moderate

adverse, indirect cumulative impact to park operations. Overall, Alternative 3 actions in combination with impacts of other actions that could affect park operations would result in negligible to minor, short- and long-term, adverse, cumulative impacts to park operations.

3.5.3 Human Health and Safety

3.5.3.1 Affected Environment

The health and safety of fire personnel, visitors, employees, and surrounding private lands of the project area, and fire personnel are of primary importance to NPS. Fire management activities and wildfires can pose risks to the public and employees, but firefighters and other fire staff face direct risks. Smoke on roads and in the Intracoastal Waterway in and adjacent to the park is of concern. Smoke from sources on and adjacent to a prescribed burn or wildfire can be a safety issue to the visiting public. The flaming front of a fire can put members of the visiting public at risk. For this reason, areas affected by fire of any cause would be closed to the public. There is always a risk that curious park visitors or residents will actually approach a fire rather than avoid it.

Prior to the ignition of any prescribed fire at the Seashore, all the burn parameters of the approved prescribed fire burn plan must be met to ensure a safe and effective prescribed fire. Neighboring landowners and residences adjacent to prescribed burns will be notified prior to implementation of the prescribed burn. Visiting public will be informed and educated when prescribed burns take place. The US Coast Guard and other local cooperators will be notified. In the event of a potentially hazardous wildfire within the Seashore, the Park Superintendent and Public Information Officer would coordinate public notification efforts within and outside the park. The extent of public notice would depend on the specific fire situation. Assuring visitor and park staff safety would take priority over other activities.

Areas treated with targeted herbicide applications as a follow-up on fuel breaks created by mechanical treatments would be temporarily closed to the visiting public to ensure they are not in application area, and appropriate informational signage would be placed at all human entryways to the spraying area.

3.5.3.2 Methodology and Intensity Threshold

The methodology used for assessing human health and safety impacts included identifying the potential affects to human health and safety by each action alternatives. The thresholds of change for the intensity of an impact are defined as follows:

Negligible: Impacts would not have a noticeable effect on human health and safety, with no injuries or loss of life.

Minor: Impacts would be detectable, but would not have an appreciable effect on human health and safety, with few or potential for minor injuries and no loss of life.

Moderate: Impacts would have readily detectable impacts and would result in substantial, noticeable effects to human health and safety on a local scale, with possible injuries, but no loss of life.

Major: Impacts would have readily detectable impacts and would result in substantial, noticeable effects to human health and safety on a local or regional scale, or with the possibility of serious injuries and/or loss of life.

Duration:

Short-term: Impacts that generally last for the duration of the project.
Long-term: impacts that generally last beyond the duration of the project

3.5.3.3 Analysis of Alternatives and Impacts on Public Health and Safety

Impacts of Alternative 1: No Action Alternative

Under this alternative, the Seashore fire management program would be limited to wildfire suppression activities approved under National Fire Policy. The inability to use more active vegetation management activities including prescribed burning, wildfire managed for resource objectives, mechanical and manual equipment use on vegetation, and targeted herbicide use would reduce the ability to reduce hazardous fuels, and restore fire-adapted ecosystems. Thus, there would be no new defensible space created, and no significant created fuel breaks. Fire would not be utilized as a natural ecological process on the landscape. This would result in the continued retention and increase of fuel buildup in the Seashore as brush density continues to increase, along with the continued accumulation of dead and down debris. This will likely lead to an increased potential for more intense wildfires that are difficult to suppress/manage. Direct impacts to firefighter health and safety include increased exposure to heat, smoke inhalation, and injuries from the use of fire-fighting equipment or fireline construction, and a higher exposure to more high severity wildfire. In addition, damage to private properties could be high and the safety to the adjacent landowners would be placed at a higher risk from high severity fire incidents. Severe wildfires could result in damage or loss to buildings (e.g., facilities), loss of life if area residents were unable or refused to leave in advance of a high intensity wildfire, exposure to smoke, and loss of quantity and quality of private forest and vegetated areas. Drift smoke from fires could affect area travel corridors including park roads and possibly campgrounds, recreational fishing and boating, and the Intracoastal Waterway, due to reduced visibility. Overall, this effect would be direct, short- to long-term, minor to moderate, adverse, localized due to potential fuel build up and the increased risk for severe wildfires.

Cumulative Impacts

The No Action Alternative in combination with the past, present, and foreseeable future actions would result in direct, minor, short- to long-term, adverse, and localized impacts due to increased potential for future severe wildfires as mid-story brush density continues to increase as a potential fuel. The No Action Alternative increases in adverse effect as time goes on and Seashore fuels continue to build. The cumulative impacts to human health and safety because of management actions would be negligible to minor and short- term due to careful pre-planning and actions conducted within thoroughly prepared prescriptions.

Conclusion

Limiting the Seashore fire program to wildfire suppression activities approved under the National Fire Policy could have direct, minor to moderate, long-term, adverse, localized impacts to firefighters, adjacent landowners, and the public through future severe wildfires from probable hazardous fuel buildup. Cumulative effects under this alternative would be direct, minor to moderate, long-term, adverse, localized impacts due to increased potential for future severe wildfires as brush density and ground cover continues to increase as a potential fuel.

Impacts to Alternative 2: Preferred Alternative

Human health and safety impacts under this alternative would be the same as the No Action Alternative with respect to direct effects of fire suppression. However, prescribed fire, managed wildfire for resource objectives, mechanical and manual hazardous fuel reduction, and targeted herbicide use would be used as management tools in combination with wildfire suppression to reduce hazardous fuels and restore fire adapted ecosystems. The use of proactive vegetation management tools would increase the ability (i.e., increased acreage) and efficiency to reduce thick brush and ground cover and to create/maintain defensible space around structures and fuel breaks. This would result in increased success in reducing hazardous fuels and of ecological restoration efforts to fire-adapted ecosystems, by reducing groundcover and opening up mid-story vegetation layers (i.e., reduced opportunities for high severity fire).

These actions would enhance the potential for lower intensity ground fires, which are easier to manage/suppress. Reducing brush density and thick ground cover would decrease potential fuel loads and creating/maintaining defensible space and fuel breaks would increase fire fighters ability to suppress/manage fires. This provides better protection than the "No Action Alternative" for firefighters, adjacent residents and landowners as well as for visitors and Seashore employees. Thus, the Preferred Alternative would have direct, minor to moderate, beneficial, long-term, localized impacts by minimizing the potential for future severe wildfires as the amount of acres restored successfully increases and acres of dense brush and ground cover (hazardous fuels) decreases.

All treatment areas would have individual treatment plans submitted for herbicide use. Herbicides would need to be pre-approved at the NPS regional and national levels. Approval may be given only after considering numerous factors including: the target use, type and effects of the specific herbicide, location where the application will occur, potential T&E species concerns, potential for getting into surface or ground water, persistence in the ecosystem, safety to employees and the public, type of application (example, spot spraying), etc. Herbicides would only be used after visitors were out of the area and appropriate informational signing was placed at all facilitated entryways to the spraying area. All staff utilizing herbicide would be trained in approved procedures related to proper handling, storage, transportation, mixing, spill prevention, and application procedures. Furthermore, federal FIFRA regulations and federal agency water quality monitoring indicate that use of herbicides in forestry practices constitutes low risk to humans (Shepard et al. 2004).

Prescribed fire, wildfires managed for resource objectives, mechanical and manual hazardous fuel reduction, and targeted herbicide use would involve more pre-planning and planned activities under defined conditions. This normally leads to better health and safety protections under more controlled conditions than the times when wildfires burn, which is usually during more severe conditions.

Health and safety of staff would be enhanced when additional fire personnel would be brought in, as needed, from interagency cooperators for prescribed fire and wildfires managed for resource objectives. Human safety is the primary objective for prescribed burns; additional staff brought in would help to ensure safety mitigations were implemented. Additional staff would also be brought in for wildfires managed for resource objectives; safety would be a primary objective of the incident action plan. Therefore, the potential for direct and indirect impacts associated with management actions, though it is not possible to eliminate them would overall be reduced. The impacts to health and safety because of vegetation management actions would be short-term, negligible to minor, adverse, localized with minimal human health and safety concerns for fire fighters and the public.

Cumulative Impacts

The Preferred Alternative in combination with the past, present, and foreseeable future actions would result in direct, negligible, short-term, adverse, localized impacts due to potential exposure to associated fire risks (e.g., heat, smoke inhalation). As well as direct, minor to moderate, beneficial, long-term, and localized impacts by minimizing the potential for future severe wildfires as the amount of acres restored successfully increases and hazardous fuel reduction increases (i.e., dense brush and ground cover).

Conclusion

The Preferred Alternative would have direct, minor to moderate, beneficial, long-term, localized impacts by reducing the potential for future severe wildfires as the amount of acres maintained and restored successfully increases and acres of mid-story brush density and ground fuels decreases. Cumulative impacts to human health and safety would be direct, negligible, short-term, adverse, localized impacts due to potential exposure to associated fire risks (e.g., heat, smoke inhalation). As well as direct, minor to moderate, beneficial, long-term, and localized impacts by minimizing the potential for future severe wildfires as the amount of acres restored successfully increases and hazardous fuel reduction increases (i.e., brush density and ground cover).

Impacts to Alternative 3: No Mechanical Treatments in Wilderness

Public health and safety impacts under this alternative would be similar to Alternative 2; however, no mechanical treatments would occur in the Wilderness area. This would make reduction of hazardous fuels less effective in the Wilderness (~20,500 acres) of the Seashore. The lack of fuel breaks would hinder prescribed and wildfire managed for resource objectives, likely leading to higher and more intense wildfires that would be harder to manage/suppress within the Wilderness than Alternative 2. The degree of impacts would vary depending on size of the fire, the location, extent, timing, and other factors related to the fire. The risk of large and high severity wildfires would increase with time in the Wilderness, while decreasing outside it as successful vegetation management projects were completed. Because of not conducting mechanical treatments in the Wilderness, wildfires originating there may be more intense and larger, thus increasing risks to adjacent residents and structures, firefighters, Seashore employees, and visitors in dealing with those fires. Impacts would be adverse, minor to moderate, short- to long-term, localized to human health and safety due to no mechanical treatments in the Wilderness.

Cumulative Impacts

Alternative 3, No mechanical in Wilderness, would have the similar impacts as Alternative 2, except that public health and safety risks in and adjacent to the Wilderness could have increased adverse impacts to fire fighters, employees, visitors, adjacent residents and landowners. Overall, impacts to public health and safety would be direct, moderate, long-term, beneficial, and localized due to using proactive vegetation management tools.

Conclusion

Impacts would be adverse, minor to major, short- to long-term, localized to human health and safety due to no mechanical treatments in the Wilderness. Without mechanical treatments along existing wilderness roads and trails, the Wilderness could not be effectively broken into smaller "burn blocks". Future severe wildfires may require utilizing roads outside the Wilderness and natural barriers as fire lines, thus increasing the size of the wildfire and the potential length of fire line. This would expose fire fighters and the public to a larger area of fire lines, suppression activities, and increased exposure to risk and smoke. Overall, impacts to public health and safety would be direct, moderate, long-term, beneficial, and localized due to use of proactive vegetation management tools.

4.0 Consultation and Coordination

The following federal and state agencies, affiliated Native American tribes, and affiliated interests were sent scoping information or were contacted for information regarding this EA.

Federal Agencies
U.S. Fish and Wildlife Service

Congressional and Delegation
United States Senator Bill Nelson
United States Senator Saxby Chambliss
United States Representative Jack Kingston

Affiliated Native American Groups
Catawba Indian Nation
Cherokee Nation
Chickasaw Nation
Eastern Band of Cherokee Indians
Kialegee Tribal Town
Muscogee (Creek) Nation
Poarch Creek Indians
Seminole Nation of Oklahoma
Seminole Tribe of Florida
Thlopthlocco Tribal Town
United Keetoowah Band of Cherokee Indians

State Agencies
Georgia Department of Natural Resources

Georgia Historic Preservation Division

4.1 List of Preparers

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4.2 Environmental Assessment Review and List of Recipients

The EA will be released for public review on October 25, 2013. To inform the public of the availability of the EA, NPS will publish and distribute a letter to various agencies, tribes, and members of the public on the National Park's mailing list, as well as issue a press release to regional newspapers and broadcast media outlets. Copies of the EA will be provided to interested individuals upon request. Copies of the document will also be available for review at the Seashore visitor center and on the NPS PEPC website at www.parkplanning.nps.gov/cuis.

The EA is subject to a 30-day public comment period ending November 29, 2013. During this time the public is encouraged to post comments online at http://parkplanning.nps.gov/cuis or via email addressed to CUIS_Planning@nps.gov., or mail comments to Attn: Superintendent, Cumberland Island National Seashore; 101 Wheeler Street, St. Marys, GA 31558. Following the close of the comment period, all public comments will be reviewed and analyzed prior to the release of a decision document. NPS will issue responses to substantive comments received during the public comment period, and will make appropriate changes to the EA as needed.

5.0 References

Executive Orders
Executive Order 11988 (Floodplain Management)
Executive Order 11990 (Protection of Wetlands)
Executive Order 12898 (Environmental Justice in Minority Populations and Low-income Populations)
Executive Order 13007 (Indian sacred sites)

NPS Director's Orders
DO-12 Conservation Planning, Environmental Impact Analysis and Decision Making
DO-18 Wildland Fire Management

DO-24 Museum Collections
DO-28 Cultural Resource Management
DO-47 Sound Preservation and Noise Management
DO-41 Wilderness
DO-77 Natural Resources Management Guideline (NPS-77)
DO-77-1 Wetland Protection
DO-77-2 Floodplain Management

Federal and Government
36 CFR Parks, Forests, and Public Property
40 CFR Protection of Environment
50 CFR Wildlife and Fisheries
1916 Organic Act
1963 Clean Air Act, as amended
1964 Wilderness Act
1966 National Historic Preservation Act
1969 National Environmental Policy Act
1970 General Authorities Act
1972 Clean Water Act
1973 Endangered Species Act
1979 Archeological Resources Protection Act
1981 Farmland Protection Policy Act
1993 Government Performance Results Act
Secretarial Order No. 3175 – Departmental Responsibilities for Indian Trust Resources

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APPENDIX A: Scoping Brochure

Cumberland Island National Seashore National Park Service U.S. Department of Interior

Public Scoping and NEPA Process for Cumberland Island National Seashore Fire Management Plan

Project Scoping for Environmental Assessment **October 16, 2012**

The National Park Service (NPS) is initiating a process to update the Fire Management Plan (FMP) for Cumberland Island National Seashore (CUIS). Before this update occurs, the NPS is preparing an Environmental Assessment (EA). This EA is part of the process to address changes in management strategies, vegetation communities, and fuel loading that has occurred over the years since island settlement, and as a result of fire suppression. This process will also be utilized to gather public input and suggestions for the revised plan. This newsletter launches the formal external (or public) scoping phase for the EA.

Background

Cumberland Island exhibits abundant vegetation and wildlife habitat, although much of the island's vegetation was altered by human activities before the National Seashore was established in 1972. In addition, vegetation and habitat have been altered through the general practice of suppressing all wildland fires, which has continued during NPS management on the island. However, research shows that prior to European settlement, parts of the island experienced low intensity surface fires every 1–6 years. But this natural fire return interval varied widely, from 5–100 years, dependent on location and vegetation type. These natural and Native American ignited fires created niches for wildlife and plant species that are now at risk of being lost due to species and vegetation structure changes wrought by fire exclusion. Research results show negative effects from fully excluding fire from the fire-adapted ecosystems of the island.

Moreover, fire exclusion has allowed the growth of unnaturally thick stands of volatile vegetation, with related debris, that burns intensely in wildfires. These intense wildfires could threaten island structures, improvements, and ecosystems. Safe suppression of these fires has become increasingly difficult, costly, and risky to firefighters.

Until the updated plan is completed, CUIS will continue to suppress wildfires and carry on the limited activities included in the 2004 Fire Management Plan. However, a new FMP is vital to address updates in national fire policy and terminology; the need to better protect island structures, facilities, and values; and the need to restore fire to its natural role in the ecology of Cumberland Island. For the new plan CUIS is considering additional pro-active measures to more actively manage wildland fire, vegetation, and related activities on the island.

Updating the Fire Management Plan

CUIS plans to adhere to the following broad goals as the NPS updates the Fire Management Plan:

1. Protection of firefighters, residents, and the public,
2. Protection of private and retained rights property, structures, improvements, and other facilities that could be damaged by wildfires,
3. Preservation of park resources–natural, cultural, and NPS improvements,
4. Restoration of the natural role of fire when possible, through use of prescribed fire, or wildfire managed for resource objectives, to facilitate continued ecological restoration and maintenance of park lands, improvements, and resources, and
5. Communication and collaboration between the NPS, residents, partner and neighbor agencies, and visitors in implementing fire management program actions.

Internal scoping by NPS specialists and staff started the EA process on August 29, 2012. The NPS is preparing this EA in compliance with the National Environmental Policy Act (NEPA) to provide the decision-making framework that 1) explores management alternatives to meet Seashore objectives, 2) evaluates potential impacts to Seashore resources and values, and 3) identifies mitigation measures to minimize the degree of these impacts. The EA will evaluate a "No Action Alternative" and at least one "Proposed Action Alternative".

A "No Action Alternative" would continue the status quo of suppressing all wildfires and minimal fuels reduction. The attendant negative effects would include continued accumulations of hazardous fuels and the associated risk both to human structures and to island natural and cultural resources.

"Proposed Action Alternative (s)" would engage the CUIS staff in more active fire management strategies. These alternatives may incorporate such activities as:

- prescribed burning in limited areas,
- defensible space vegetation work around improvements,
- developing fuel breaks along some island roads and trails using mechanical type equipment and limited herbicide,

- developing safe procedures to utilize wildland fire for obtaining resource objectives under certain conditions in the Wilderness and to the south of Dungeness on the island (wildland fire for resource objectives is allowing natural start fires to burn with limitations to obtain ecological balance and hazardous fuel reduction), and
- Defining tactics for suppression of wildland fires

If approved, park management would implement these changes at a reasoned pace to allow wildlife, vegetation, residents, and visitors time to adjust to change on the island. The NPS believes that a well-managed and focused fire management program is vital for protection and restoration of resources on CUIS.

Additional objectives and mitigation tactics would be developed as part of this EA process to minimize the impact to island resources and manmade improvements. Fire Management Units (see figure 1 for proposed fire management units) would be developed that would define and organize the type of fire management activities that could occur on various areas of the island. Other examples of potential mitigation activities include limiting herbicide use to spot or boom spraying of defensible space or fuel break areas. Prescribed burns could occur in certain areas at defined times. These planned burns would have formal objectives developed under a separate burn plan, and would be implemented by qualified fire personnel. Managing naturally ignited (lightning) wildland fires for resource objectives would only be implemented during conditions where control would be practical and results beneficial. Fuel breaks would be developed around the island to assist in wildfire suppression and prescribed fire activities.

There are two formal opportunities for the public to comment: during this initial project scoping, and again following the release of the EA document. You are invited to participate in this process by voicing your ideas, suggestions, comments, or concerns related to CUIS fire management activities. These comments will be considered during preparation of the EA.

Overview of the Process

The basic steps of the NEPA process for this project include:

- **Public scoping period (October 15 – November 30th, 2012)***
- **Camden County public scoping meeting, open house format, November 19, 2012, 6:00 PM until 8:00 PM, at Cumberland Island National Seashore Visitor Center, St. Marys, Georgia.***
- **Cumberland Island public scoping meeting, November 20, 2012, 1:00PM, at Black Barracks, Dungeness Historic District.***
- Preparation of the EA, (public release expected early summer 2013)
- **Public review of the EA***
- Analysis of public comment on the EA
- Preparation of decision document
- Announcement of decision
- Implementation

*** indicates formal opportunities for public comment**

Resources and Concerns

The Environmental Assessment will analyze potential impacts to a number of resources including:

Soil, Water Resources (including Floodplains and Wetlands), Air Quality, Vegetation, Wildlife, Species of Special Concern, Cultural and Historic Resources, Soundscapes, Public Health and Safety, Island Operations, and Visitor Use & Experience.

Ideas to Consider

Following are a few ideas to consider as you develop comments on this project:

- Are there any missing issues or concerns that should be addressed in the EA?
- Are there other options or information that you think should be considered?
- Do you have other comments and suggestions for us to consider in the CUIS Fire Management Program?

How Do I Comment on This Project?

Please submit your comments online at the NPS Planning, Environment, and Public Comment website:

http://parkplanning.nps.gov/cuis/

Comments may also be sent via email to CUIS_Planning@nps.gov. If you are unable to submit comments electronically, then you may submit written comments to:

Attention: Superintendent
Cumberland Island National Seashore
101 Wheeler Street,
St. Marys, GA 31558

You may also hand-deliver written comments to the visitor center or Seashore headquarters in St. Marys, Georgia.

Please provide all initial comments by November 30, 2012.

If you wish to be added to or removed from the Seashore's mailing list for future correspondence, please indicate that in your response.

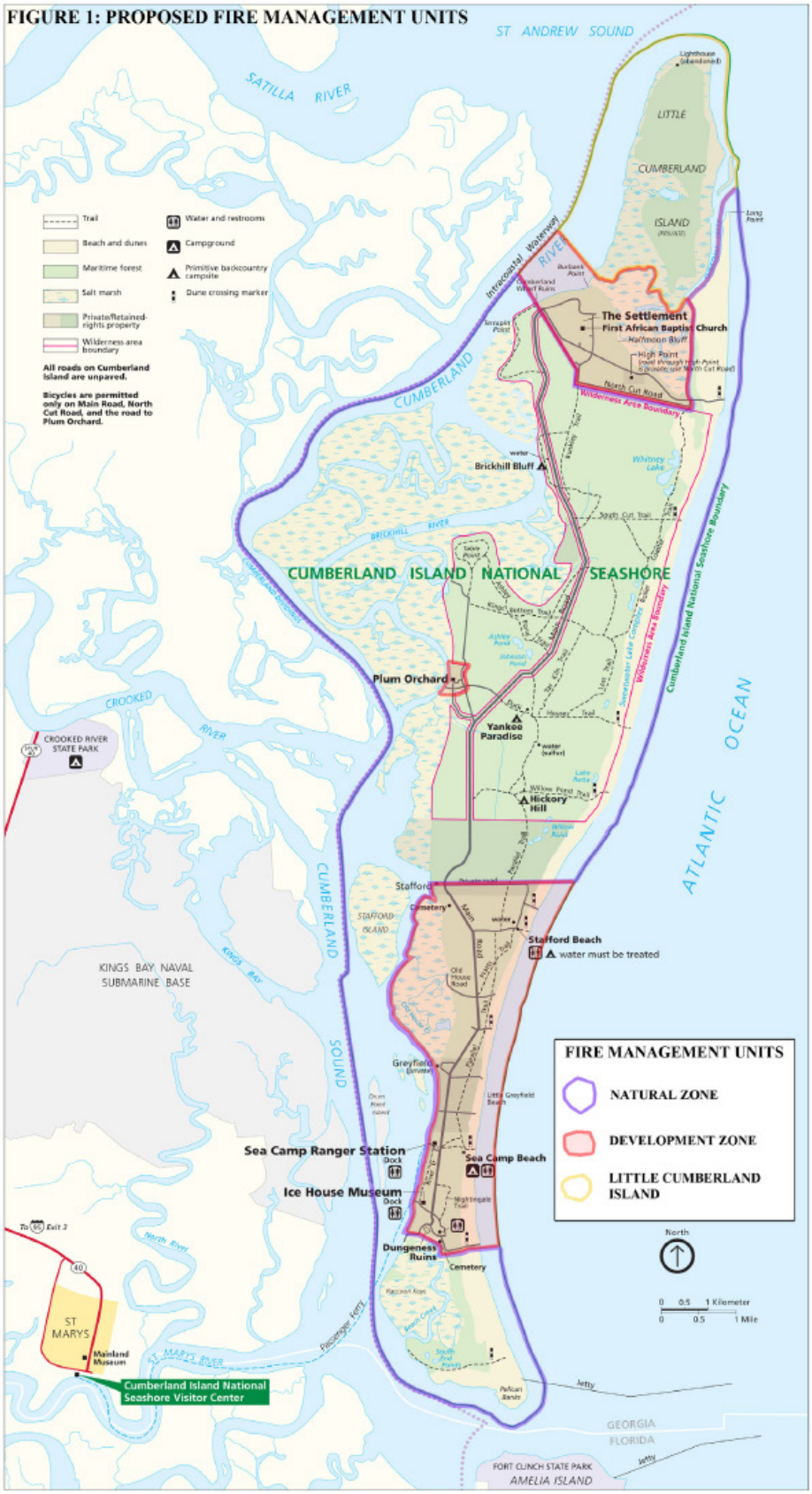
FIGURE 1: PROPOSED FIRE MANAGEMENT UNITS
ST ANDREW SOUND
SATILLA RIVER
LITTLE CUMBERLAND ISLAND
Trail
Beach and dunes
Maritime forest
Salt marsh
Private/Retained-rights property
Wilderness area boundary
Water and restrooms
Campground
Primitive backcountry campsite
Dune crossing marker
All roads on Cumberland Island are unpaved.
Bicycles are permitted only on Main Road, North Cut Road, and the road to Plum Orchard.
The Settlement
First African Baptist Church
Brickhill Bluff
CUMBERLAND ISLAND NATIONAL SEASHORE
Plum Orchard
Yankee Paradise
Hickory Hill
Stafford
Stafford Beach
water must be treated
KINGS BAY NAVAL SUBMARINE BASE
Sea Camp Ranger Station
Sea Camp Beach
Ice House Museum
Dungeness Ruins
Cemetery
CROOKED RIVER STATE PARK
ST MARYS
Mainland Museum
Cumberland Island National Seashore Visitor Center
Passenger Ferry
ATLANTIC OCEAN
Cumberland Island National Seashore Boundary
GEORGIA
FLORIDA
FORT CLINCH STATE PARK
AMELIA ISLAND
FIRE MANAGEMENT UNITS
NATURAL ZONE
DEVELOPMENT ZONE
LITTLE CUMBERLAND ISLAND
North
0 0.5 1 Kilometer
0 0.5 1 Mile

APPENDIX B: Glossary of Fire Management Terms

Fire Management Terminology Used in Seashore Fire Documents

Appropriate Response Specific actions taken in response to a wildland fire to implement protection and incident objectives.

Burned Area Emergency Rehabilitation (BAER) This is an agency process following wildfires where planned emergency actions are authorized and funded to minimize post-fire damage to resources, structures, and values. The funding and actions are limited to planned and prioritized activities.

Benefits Fire effects with positive value or that contributes to organizational goals. Benefits should be explained as a desired outcome focusing on successfully meeting resource or protection objectives, depending on location and conditions.

Burn Plan A plan required for each prescribed fire application ignited by managers. It must be prepared by qualified personnel and approved by the appropriate agency administrator (Superintendent) prior to implementation. Each plan will follow specific agency direction and must include critical elements described in agency manuals.

Burning Period The part of each 24-hour period when fires spread most rapidly; typically from 10:00 AM to sundown.

Categorical Exclusion (CE) Certain pre-defined exceptions to the National Environmental Policy Act (NEPA) that allow activities to occur without full, detailed environmental analysis, or where a general analysis for certain actions has been done in advance. The original FMP at CUIS was approved utilizing a CE that the NPS has determined will no longer be valid.

Cumberland Island National Seashore (Seashore) Applies to the land under the jurisdiction of this unit of the National Park Service, or the management staff of this NPS unit.

Cultural Values These values includes all historic structures, ethnographic, cultural landscapes, and archeological areas. May be documented or undocumented, may be a site where something occurred with no physical remains, and/or may be site specific or more general in location.

Defensible Space Refers to the size or type of vegetation clearing, thinning and/or fuel reduction needed to protect a structure or other identified value from wildfire during defined fire conditions. The work needed varies widely depending on type and amount of vegetation, vulnerability and value of the structure or site, and the range of fire conditions expected. Good defensible space is not an absolute guarantee that the value will not burn, but greatly increases the likelihood that it will survive a wildfire. Defensible space usually must be maintained over time as vegetation tends to grow back after reduction.

Direct Attack Fire tactic where firefighters or firefighting equipment take actions right on the edge of the fire to stop its advance as close to the fire as safely possible, and depriving the fire of additional vegetative fuels to burn. Direct attack is difficult or not feasible when flame lengths exceed 4 feet, or in thick vegetation where firefighter safety zones are not present.

Environmental Assessment (EA) A NEPA document that is prepared to (a) help determine whether the impact of a proposal or alternatives could be significant; (b) aid NPS in compliance with NEPA by evaluating a proposal that will have no significant impacts, but that may have measurable adverse impacts; or (c) evaluate a proposal that either is not described on the list of categorically excluded actions, or is on the list but exceptional circumstances apply.

Escaped Prescribed Fire Prescribed fires are intentionally ignited fires that burn under specified conditions and a written plan. If the fire escapes the burn unit, the Contingency Plan component of the Prescribed Burn Plan is activated. If it is successful in bringing the fire back within the scope of the Prescribed Burn Plan, the project may continue. If prescribed fire objectives are exceeded or no longer met, and the fire continues, it could be converted to a wildfire and appropriate suppression occurs.

Fire Adapted Ecosystems Inter-related relationships where the plants and animals are adapted to periodic wildfires. Some species depend on wildfire to initiate their renewal, growth, or propagation. Numerous species exploit the changed conditions after a fire to expand their range or increase their numbers due to change in the status of resources, space, or other changed environmental factors after fires.

Fire Adapted Species Plant or animal species that depend on fire to initiate their renewal, growth, or propagation. Some species cannot exist without periodic fires to change the vegetative or physical environment. Some fire adapted species have gone extinct in areas where fire suppression has prevented periodic fire.

Fire Management All activities related to the management of wildland fires.

Fire Management Officer (FMO) NPS official under the direction of the Park Superintendent, or staff, with responsibility to implement the Fire Management Plan and supervise unit fire management activities, preparedness, prevention, and response. Ensures all NPS and national safety standards are followed, and develops and maintains communications with interagency cooperators.

Fire Management Plan (FMP) A plan that identifies and integrates all wildland fire management and related activities within the context of approved land/resource management plans. It defines a program to manage wildland fires (wildfire and prescribed fire). The plan is supplemented by operational plans, including but not limited to preparedness plans, preplanned dispatch plans, prescribed fire burn plans and prevention plans. Fire Management Plan's assure that wildland fire management goals and components are coordinated.

Fire Management Units Designated areas within a park unit where similar fire management activities and responses occur. Helps fire managers determine pre-planned response actions and fuels management work within the constraints of the FMP, fire policy, park objectives and values, protection of private property, etc.

Fire Regime A generalized description of the role natural fire plays in an ecosystem. It is characterized by fire frequency, predictability, seasonality, intensity, duration, scale (patch size), as well as regularity or variability.

Foam Chemical or dispersant additive to water, usually detergent based, that allows the water-foam mix to be more effective when used on vegetation for wildland fire. The mix smothers or cools the fire, allows it to better penetrate vegetative fuels, and/or does direct extinguishment of flame. Usually applied either by fire engines with automatic mixing equipment, helicopter bucket drops, or (rarely) ground pumps using fixed water sources.

There are additional products now being used where some engines can apply "structural foam" directly to structures in advance of wildfire impact to prevent fire from igniting the structure. It is usually longer lasting, and is usually washed off the structure after the fire threat is over.

Fuels Management Activities Often used interchangeably with vegetation management activities, (see below).

Hazard Fuels Excessive live and/or dead wildland fuel accumulations (either natural or created) having the potential for the occurrence of intense wildland fire.

Hazard Fuel Reduction Hazard fuel reduction projects remove excessive live or dead fuel to protect life, property, cultural, and natural resource values. This could include structures and private properties; natural resources, including critical native plant communities and their processes, and threatened and endangered species; and important cultural, historic, and/or archaeological resources. These treatments, a variety of fire and non-fire techniques, include, prescribed fire and wildfire managed for resource objectives, mechanical vegetation cutting and removal, targeted herbicide application, and manual methods.

Herbicide Use In this analysis targeted herbicide application is used as a follow-up treatment to fuel breaks created by mechanical treatments. This would help to slow regrowth of brush species and help to maintain the fuel breaks.

Incident Objectives Incident specific guidance and direction necessary for the selection of the appropriate strategies for the tactical direction of resources.

Indirect Attack Tactic utilized to stop fire advance away from the fire perimeter, but defining limits to fire's advance. Indirect tactics include constructing fireline, utilizing existing roads or natural barriers, changes in vegetation type, etc. Often safer in thick fuels or where flame lengths are high. Allows firefighters to construct fireline and/or burn out fuels in advance of the fire's arrival, thus depriving the fire of fuels, and stopping its advance. Distance from the fire depends on vegetation, fire behavior, anticipated and actual weather, values at risk, time, available firefighting resources, etc.

Initial Action The actions taken by the first resources to arrive at a wildfire.

Initial Attack First action(s) taken to put the fire out, consistent with firefighter and public safety, and values to be protected. Describes the initial response and actions used on most fires where the intent from the onset is to suppress the fire as quickly and cost effectively as possible. Usually used where the focus is on full perimeter control and extinguishment in the first burning period.

Initial Response Immediate decisions and actions related to an ignition. All fires receive a response, which may not involve taking action on the ground, but may include a management or initial decision to postpone taking action on the ground to a later time based on conditions, safety, and competing priorities. A planned response, based on fire management objectives, initiated on every fire.

Manual Treatments Activities that occur through the use of hand tools (ax, pulaski, cross-cut saw, pruners, shovel, etc.). It is a method of reducing hazardous accumulations of wildland fuels, and is used to create defensible space near structures or values. Does not include motorized equipment in this analysis.

Mechanical Treatments Vegetation management activities that include using wheeled or tracked equipment (mowers, masticators, choppers, skidders, bulldozers, etc.) and/or handheld motorized equipment (weed eaters, chainsaws, hand-held brush cutters, leaf blowers, etc.). It is a method of reducing accumulations of wildland vegetative fuels, and is used to create defensible space near structures and fuel breaks.

Minimum Impact Suppression Techniques (MIST) Minimum Impact Suppression Tactics (also referred to as Minimum Impact Techniques) are guidelines that assist fire personnel in the choice of procedures, tools, and equipment used in fire suppression and post-fire rehabilitation. These techniques reduce soil disturbance, impacts to water quality and wildfire, noise disturbance, intrusions in the wilderness, and cutting or trampling of vegetation. MIST policy is primary guidance in NPS managed natural areas, especially Wilderness.

National Environmental Policy Act (NEPA) Process The objective analysis of a proposal to determine the degree of its environmental and interrelated social and economic impacts on the human environment, alternatives and mitigation that reduce that impact, and the full and candid presentation of the analysis to, and involvement of, the interested and affected public.

National Fire Policy The interagency policy that guides management of all aspects of wildland fire for all federal agencies and most states. Includes direction on safety, ecosystem sustainability, response, use of wildland fire, rehabilitation and restoration, protection priorities, WUI, planning, science, preparedness, suppression, etc. See http://www.nifc.gov/policies/policies_documents/GIFWFMP.pdf for more detail.

National Park Service (NPS) A bureau of the Department of the Interior, which manages a nationwide system of units dedicated to protecting and preserving areas with diverse natural, historical, and cultural values while allowing for visitor use and enjoyment that does not impair those values.

Planned Ignition The intentional initiation of a prescribed fire in the wildland by hand-held, mechanical or aerial devices (see prescribed fire).

Prescribed Fire Fires originating from a planned ignition to meet specific objectives identified in a written, approved, prescribed burn plan. NEPA have been met prior to ignition (see planned

ignition). Any fire intentionally ignited by management under an approved plan to meet specific incident objectives.

Protection The actions taken to limit the adverse environmental, social, political, and economical effects of fire.

Resource Advisor Assigned position on many longer and larger wildfire incidents. Usually a resource specialist who assists the incident commander and fire organization by providing focus and specialized knowledge related to protecting and preventing damage to unit natural and cultural values and resources, within the context of the incident objectives.

Response to wildland fire The mobilization of the necessary services and responders to a fire based on ecological, social, and legal consequences, the circumstances under which a fire occurs, and the likely consequences on firefighter and public safety and welfare, natural and cultural resources, and values to be protected.

Fire Retardant In wildland firefighting, a compound made by mixing chemicals with water to form a slurry that is dropped on vegetation to reduce flammability or delay their combustion. Dropping is usually performed by fixed wing air tankers, but can also be done by helicopter if a mobile retardant mixing station is set up nearby. Typical retardant now in use consists of ammonium phosphate compounds dyed red to aid in determining effectiveness of drops. To be effective in suppressing wildland fire, retardant must be followed up by ground firefighting resources.

Superintendent In the context of these documents, the senior NPS management official with responsibility for approving general direction in the Fire Management Plan (and other park planning documents), and ensures that it receives annual review and update. Provides appropriate and reasonable review and oversight of fire management program and operations, and ensures that they are integrated with other park goals and objectives. Has other fire related responsibilities such as approving retardant use in the unit, approving equipment use in Wilderness, approving prescribed fire burn plans, fiscal responsibilities, etc.

Suppression All the work of extinguishing a fire or confining fire spread. This tactic can be used on a whole fire or part of a fire.

Unplanned Ignition The initiation of a wildland fire by lightning, volcanoes, unauthorized and accidental human-caused fires (see wildfire).

Use of Wildland Fire Management of either wildfire or prescribed fire to meet resource objectives specified in the Fire Management Plan.

Vegetation Management Activities Actions taken to reduce or thin the amount of vegetative fuels available for burning. Vegetative fuels include dead vegetation and logs, live trees, brush and shrubs, grass and all live and dead vegetation that can burn. Actions can be by hand tools (ax, pulaski, cross-cut saw, pruners, shovel, etc.), handheld equipment (weed eaters, chainsaws, leaf blowers, etc.), and wheeled or tracked equipment (mowers, masticators, choppers, skidders, bulldozers, etc.). The type of equipment available to use is usually set by policy and the Fire Management Plan. The specifics

are usually laid out in a written site specific fuels management or defensible space plan, unless occurring under emergency wildfire conditions.

Wildfire Unplanned ignition of a wildland fire (such as a fire caused by lightning, volcanoes, unauthorized and accidental human-caused fires) and escaped prescribed fires. (See unplanned ignition and escaped prescribed fire).

Wildland Fire A general term describing any non-structure fire that occurs in the wildland; includes prescribed fires.

Wildfire Managed for Resource Objectives A term used to describe a fire started by lightning (unplanned ignition) and allowed to burn under written, defined conditions for resource management objectives. Examples of resource objectives include returning fire to a fire adapted ecosystem, reduction of vegetative fuels, opening up areas for fire adapted species, decreasing brush, renewing grassland habitat for herbivores, opening up the tree canopy for endangered bird species, reducing the chance of stand replacing fire in more extreme conditions, etc. Utilizing this tool is only permitted where pre-planned in an approved FMP. Use may also be limited by availability of firefighting resources, safety, weather, vegetation conditions, fire behavior, national and regional fire preparedness levels, values at risk (natural, cultural, and private property), and other factors. A fire may be managed for resource objectives in one area, while being suppressed in another area.

Wilderness Refers to lands protected under the Wilderness Act, (1964). The basic requirement is to preserve the wilderness character in those areas. Congress approves wilderness areas through legislation that often allows some variation in the character and uses of those areas. All fire management actions in wilderness will be consistent with the "minimum requirement" concept, (see section 6.3.5of NPS Management Policies, 2006), which is a process to determine the tools that will have the least effect on the character of the wilderness, balanced with the need to accomplish some activity and to minimize impacts of that needed activity.

Wildland Urban Interface (WUI) An area where structures and other human development meet or intermingle with undeveloped wildland or vegetation fuels.