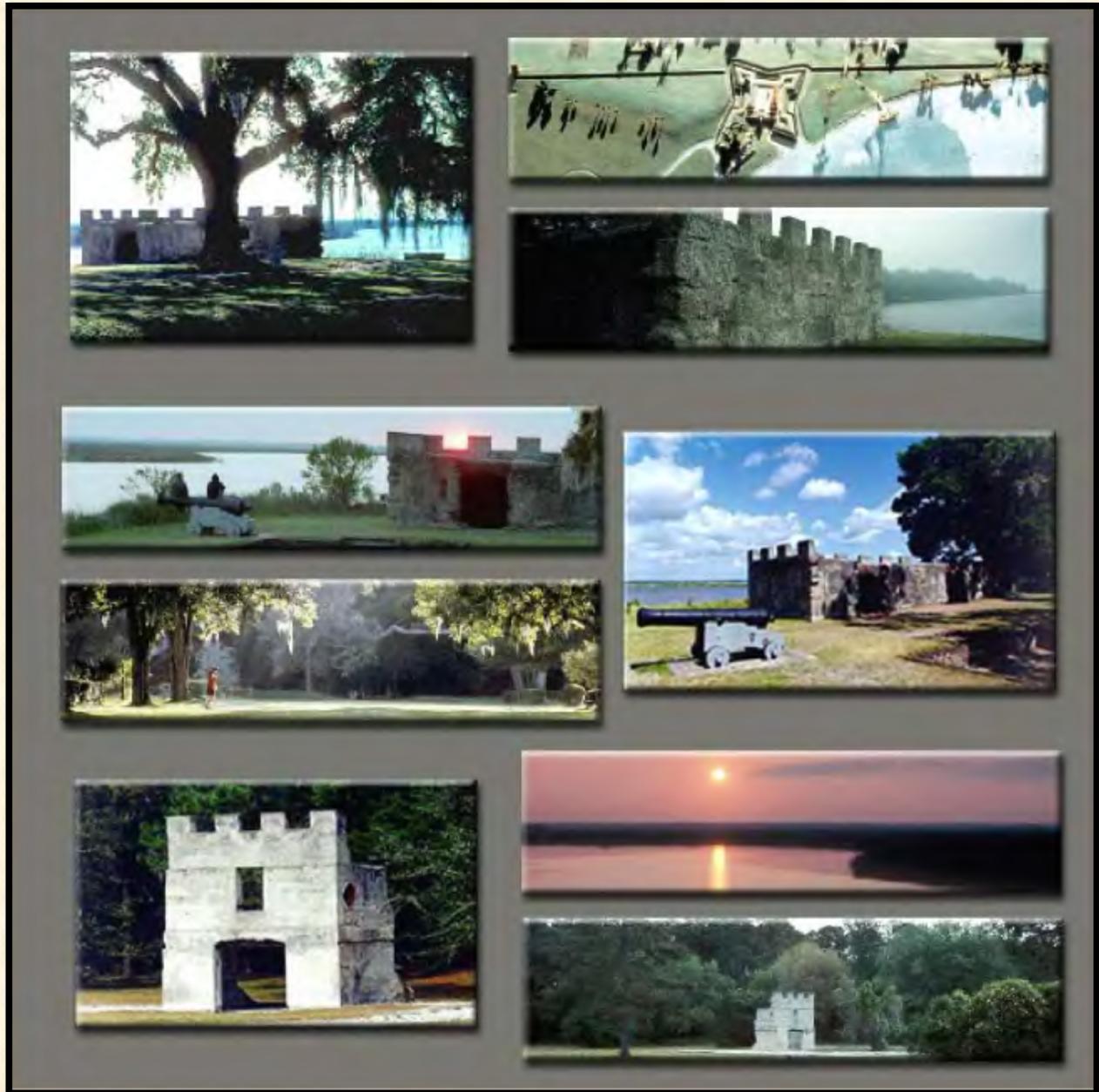

FORT FREDERICA NATIONAL MONUMENT

FIRE MANAGEMENT PLAN

(St. Simons Island, Georgia)



ENVIRONMENTAL ASSESSMENT
MAY 2004

Fort Frederica National Monument
Fire Management Plan – Environmental Assessment

National Park Service
U.S. Department of the Interior

Fort Frederica National Monument
Rte 9, Box 286C
St. Simons Island, GA 31522

Document Prepared by:
Mangi Environmental Group
7915 Jones Branch Drive
Ste. 2300
McLean, VA 22102

Project Manager:
Joel Gorder

Geographic Information Systems Analyst:
Rebecca Whitney

Compilation date: May 2004



United States Department of the Interior

NATIONAL PARK SERVICE
Fort Frederica National Monument
Route 9, Box 286-C
St. Simons Island, GA 31522
(912) 638-3639



April 28, 2004

Dear Interested Party,

Enclosed is a copy of the Fort Frederica National Monument Fire Management Plan Environmental Assessment for your comment and review. This environmental assessment was prepared pursuant to the National Environmental Policy Act (NEPA). Our records indicate that you have participated in the planning process or have requested to receive copies of the park's planning documents.

National Park Service Wildland Fire Management Guidelines (DO-18) mandates, "All parks with vegetation that can sustain fire must have a fire management plan." The purpose of this federal action is to develop a fire management plan and program that utilizes the benefits of fire to achieve desired natural and cultural resource conditions while minimizing the fire danger to park resources and adjacent lands from hazardous fuel accumulations.

Based on the analysis, I consider Alternative 3 to be the Park's preferred alternative for best accomplishing the purpose and need for this Proposed Action. Under this alternative, fire management activities would protect park resources and adjacent lands from the threat of wildfires, and utilize to prescribed fire to reduce hazard fuels, promote ecosystem sustainability, and to restore and maintain the historic landscape. This alternative also best protects and helps preserve the historic, cultural, and natural resources in the park for current and future generations.

Additional information concerning the Fort Frederica National Monument Fire Management Plan can be obtained from:

Michael Tennent, Superintendent
Fort Frederica National Monument
Rte 9, Box 286C
St. Simons Island, GA 31522

Written comments will be accepted until June 17, 2004, 30 days after the publication of the environmental assessment Notice of Availability in the Brunswick News, which will be on or about May 12, 2004. Please include the following information when submitting comments:

Name, address, and (if possible) telephone number;
Title of the document on which the comments are being submitted; and,

Specific facts of comments, along with the supporting reasons, that the Superintendent should consider in reaching a final decision.

Comments received in response to this solicitation, including names and addresses, will be part of the public record and available for public inspection.

Comments on this environmental assessment can be provided by e-mail (michael_tennent@nps.gov), fax: (912)-638-3639 phone: (912) 638-3639, or mail to Michael Tennent, Superintendent, Fort Frederica National Monument, Rte 9, Box 286C, St. Simons Island, GA 31522.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael Tennent", with a long horizontal flourish extending to the right.

Michael Tennent
Superintendent

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Chapter 1 - Purpose and Need

1.1 INTRODUCTION

This Environmental Assessment (EA) documents the potential environmental impacts from actions proposed in the Fort Frederica National Monument Fire Management Plan.

This EA has been prepared in compliance with:

- The National Environmental Policy Act (NEPA) of 1969 (42 United States Code (USC) 4321 et seq.), which requires an environmental analysis for major Federal Actions having the potential to impact the quality of the environment;
- Council of Environmental Quality Regulations at 40 Code of Federal Regulations (CFR) 1500-1508, which implement the requirements of NEPA;
- National Park Service Conservation Planning, Environmental Impact Analysis, and Decision Making; Director's Order (DO) #12 and Handbook.

*The Purpose of an
Environmental Assessment (EA)*

There are three primary purposes of an EA:

- To help determine whether the impact of a proposed action or alternative could be significant, thus indicating that an environmental impact statement (EIS) is needed;
- To aid in compliance with NEPA when no EIS is necessary by evaluating a proposal that will have no significant impacts, but that may have measurable adverse impacts; and
- To facilitate preparation of an EIS if one is necessary.

Key goals of NEPA are to help Federal agency officials make well-informed decisions about agency actions and to provide a role for the general public in the decision-making process. The study and documentation mechanisms associated with NEPA seek to provide decision-makers with sound knowledge of the comparative environmental consequences of the several courses of action available to them. NEPA documents, such as this EA, focus on providing relevant information to assist the agency in making appropriate decisions. In this case, the superintendent of Fort Frederica National Monument is faced with a decision to develop the park's Fire Management Plan as described below. This decision will be made within the overall management framework already established in the 2001 Fort Frederica National Monument General Management Plan and consistent with 2001 federal wildland fire management policy and guidelines. The alternative courses of action to be considered at this time are, unless otherwise noted, crafted to be consistent with the concepts established in the General Management Plan (copies of the General Management Plan can be obtained by contacting NPS personnel at the park) and the 2001 federal wildland fire management policy and guidelines.

In making decisions about National Park Service (NPS) administered resources, the NPS is guided by the requirements of the 1916 Organic Act and other laws, such as the Clean Air Act, Clean Water Act, and Endangered Species Act. The authority for the conservation and management of the National Park Service is clearly stated in the Organic Act, which states the

agency's purpose: "...to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." This authority was further clarified in the National Parks and Recreation Act of 1978: "Congress declares that...these areas, though distinct in character, are united...into one national park system.... The authorization of activities shall be construed and the protection, management, and administration of these areas shall be conducted in light of the high public value and integrity of the National Park System and shall not be exercised in derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress."

Public Law 74-617 established the Fort Frederica National Monument on Saint Simons Island on May 26, 1936. The original Act limited the site to 80 acres and authorized the Secretary of the Interior "to accept donations of land, interests in land, buildings, structures, and other property within the boundaries of the said national monument..." It also authorized acceptance of donations of funds for the purchase of tracts of land within the National Monument. Congress, through Public Law 81-793, amended the establishing legislation on September 20, 1950 to increase the authorized boundary from 80 acres to 100 acres. Finally, on May 16, 1958 Congress approved Public Law 85-401, which increased the authorized boundary from 100 acres to 250 acres and directed the Secretary of the Interior to acquire, "by purchase, condemnation, or otherwise," the Battle of Bloody Marsh memorial site on Saint Simons Island. Furthermore, Public Law 85-401 authorized and directed the acquisition of additional marshland acreage subject to the 250-acre limitation, across the Frederica River to the west of the National Monument for additional protection of the historic scene. Fort Frederica acquired another 28 acres of land, including river frontage, on the south side of the town site in 1994.

The requirements placed on the National Park Service by these laws, especially the Organic Act, mandate that resources are passed on to future generations "unimpaired" (DOI, 2001a). An impairment is an impact that, in the professional judgment of the responsible National Park Service manager, would harm the integrity of park resources or values, including opportunities that otherwise would be present for the enjoyment of those resources or values. An impact would be less likely to constitute an impairment to the extent that it is an unavoidable result from an action necessary to preserve or restore the integrity of park resources or values (DOI, 2001b). This EA addresses whether the actions of the various alternatives proposed by Fort Frederica National Monument impair resources or values that are (1) necessary to fulfill specific purposes identified in the enabling legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, and (3) identified as a goal in the park's general management plan or other NPS planning documents (see *Chapter 3 – Environmental Consequences*).

1.2 PURPOSE AND NEED

According to fire ecologist Dr. Cecil Frost (1998), "... fire once played a role in shaping all but the wettest, the most arid, or the most fire-sheltered plant communities of the United States." Lightning-caused fires were a major environmental force shaping the vegetation of North America for millions of years prior to human settlement. Fire-dependent ecosystems developed,

as did individual plant species dependent upon or adapted to wildland fire. Coastal Plain forests in the South are predominantly pine in the uplands and hardwoods in the floodplains of major and minor rivers. Before European settlement, fire in virtually all forest types in the Coastal Plain had a return interval of less than 13 years (Frost 1998).

Early accounts and archeological evidence indicates that early Native Americans also utilized fire to modify ecosystems (Barrett 1980, 1981; McClain and Elzinga 1994; Russell 1983; Whitney 1994), with profound cumulative effects on the landscape. At the time of European contact, many eastern deciduous forest were open and park-like, with little undergrowth (Bonnicksen 2000, Day 1953, Olsen 1996); "...the only way for eastern forests to have displayed the open-stand characteristics that were common at European settlement is if those communities had regularly been burned by native people as part of aboriginal land management activities." By the end of 19th century and extending into the 20th century, the remaining southern forests were extensively logged to support economic expansion. Suppressing all fire was seen as the only way to reforest the cutover land. The rising value of pine pulpwood also helped fire control efforts. Pulp and paper companies invested heavily in manufacturing plants and wanted to protect their investments. They provided political support for increasing public expenditures for fire suppression on private as well as public land. A rise in public land ownership brought the Forest Service and National Park Service into suppression efforts. In the 1920s, the Forest Service was opposed to the use of fire in forests, and even light burning was prohibited on the recently established national forests. Earlier leaders of the Agency, however, recognized that fire exclusion led to another set of problems and advocated the use of prescribed burning under southern pines to reduce hazards.

While a natural fire regime currently no longer exists at the park, the natural role of fire is increasingly being recognized and incorporated into forest management. National Park Service Wildland Fire Management Guidelines (DO-18) states, "All parks with vegetation that can sustain fire must have a fire management plan." The purpose of this federal action is to develop a fire management plan and program that utilizes the benefits of fire to achieve desired natural and cultural resource conditions while minimizing the fire danger to park resources and adjacent lands from hazard fuels accumulations. There is a need to manage native plant communities, and restore and protect the historic landscape while at the same time protecting visitors, facilities, and resources on and adjacent to the park.

1.2.1 Human Health & Safety

A key component in meeting the underlying need for the proposed project is the protection and treatment of the wildland urban interface. The wildland urban interface refers to areas where wildland forests meet urban developments, or where forest fuels meet urban fuels (such as houses). These areas encompass not only the interface (areas immediately adjacent to urban development), but also the continuous slopes and fuels that lead directly to the urban developments. Within Fort Frederica National Monument there are two sections of the main park unit perimeter, bordering residential and commercial property, totaling approximately 2,055 linear feet and 1.6 acres. Reducing the fire risk in the wildland urban interface requires the efforts of federal, state, and local agencies, tribes, and private individuals. "The role of [most] federal agencies in the wildland urban interface includes wildland fire fighting, hazard fuels

reduction, cooperative prevention and education and technical experience. Structural fire protection [during a wildfire] in the wildland urban interface is [largely] the responsibility of Tribal, state, and local governments” (USDA 2003). The National Park Service does have the responsibility, however, for structural fire protection within its boundaries. Property owners share a responsibility to protect their residences and businesses and minimize fire danger by creating defensible areas around them and taking other measures to minimize the fire risks to their structures (USDA 2003). With treatment, a wildland urban interface can provide firefighters a defensible area from which to suppress wildland fires or defend communities. In addition, a wildland urban interface that is properly thinned will be less likely to sustain a crown fire that enters or originates within it.

1.3 BACKGROUND

Fort Frederica National Monument is located near the Atlantic coast city of Brunswick, Georgia, on the western edge of Saint Simons Island. It is situated on a bluff overlooking the Frederica River and the vast salt marshes beyond. The monument’s authorized boundary includes approximately 99 acres of marsh west of the river. It also includes the 8-acre Bloody Marsh unit located about six miles south of the Fort Frederica Visitor Center near the Saint Simons Island Airport. Saint Simons Island is the second largest of Georgia’s barrier islands (Cumberland Island being the largest), and is approximately 11.5 miles long and ranges from .5 mile to 2.5 miles wide. It is also the most populated of all the Georgia barrier islands with about 14,000 permanent residents and approved developments for the north end of the island that will accommodate another 5,000 residents when complete in about 25 years.

The monument’s significance lies in the fact that the Fort Frederica town site and the associated Battle of Bloody Marsh unit commemorate the British victory over the Spanish on Saint Simons Island, which effectively ended the Spanish claim to Georgia and the Carolinas. In addition, the settlement at Fort Frederica was home at various times during the Frederica period (1736-1758) for General James Edward Oglethorpe, founder and first governor of the British colony of Georgia, and for John and Charles Wesley, the founders of Methodism. The monument also contains a remarkable breadth of intact archeological resources of the Colonial period, and the site itself is important in the development of historical archeology as a science and as an educational medium. The cultural/archeological resources of Fort Frederica consist of 19 brick, tabby, and earthen remains of foundations and other structures that were part of the original settlement. All of these structures are individually listed on the National Register of Historic Places. Only five of the structures are above ground level; the remainders are archeologically exposed foundations. There are also very likely additional physical remnants of the settlement, which are still buried in the areas around the foundations and in other areas of the site. Physical artifacts that have been recovered from the site are housed in a windstorm resistant museum storage facility adjacent to the maintenance compound and at the Southeast Archeological Center (SEAC) in Tallahassee, Florida.

Since 1936, when Fort Frederica National Monument entered NPS administration, all wildland fire within its boundaries has been suppressed. The annual occurrence of wildland fires at Fort Frederica is extremely low; so low, in fact, that there is no documented wildland fire data for the monument.

1.4 FIRE MANAGEMENT OBJECTIVES

National Park Service Wildland Fire Management Guidelines (DO-18) requires that all parks with vegetation capable of sustaining fire develop a wildland fire management plan that will meet the specific resource management objectives for that park and to ensure that firefighter and public safety are not compromised. This guideline identifies fire as the most aggressive natural resource management tool employed by the National Park Service. The guideline further states that all fires that occur in the wildland are classified as either wildland or prescribed fires. Prescribed fires and wildland fire use may be authorized by an approved wildland fire management plan and contribute to a park's resource management objectives. Wildland fires are unplanned events and may or may not be used to achieve resource management objectives by a park. At Fort Frederica National Monument, wildland fires will not be used to achieve resource management objectives.

Wildland is an area in which development is essentially nonexistent, except for roads, railroads, power lines, and similar transportation facilities. Structures, if any, are widely scattered.

Wildland Fires are any non-structural fires, other than prescribed fires, that occur in the wildland. This term encompasses fires previously called both wildfires and prescribed natural fires.

Prescribed Fires are any fires ignited by management actions in defined areas under predetermined weather and fuel conditions to meet specific objectives.

Wildland fire use is the management of naturally ignited (e.g. lightning) wildland fires to accomplish specific pre-stated resource management objectives in predefined geographic areas outlined in Fire Management Plans.

DO-18 identifies three paramount considerations for each park's fire management program. They are:

- Protect human life and property both within and adjacent to Park areas;
- Perpetuate, restore, replace, or replicate natural processes to the greatest extent practicable; and
- Protect natural and cultural resources and intrinsic values from unacceptable impacts attributable to fire and fire management activities

This fire management plan serves as a detailed and comprehensive program of action to implement federal fire management policy principles and goals, which in turn support the park's General and Resource Management plan objectives, as well as its enabling legislation. The park does not currently have a Cultural Landscape Report. The overall objectives of the Fort Frederica National Monument Fire Management Plan are the following:

- Suppress all wildland fire in a cost-effective manner, consistent with resource objectives, considering firefighter and public safety (always the highest priority), and values to be protected (including adjacent non-agency land).
- Use prescribed fire and/or non-fire applications to:

- Reduce hazard fuels accumulations, which in turn:
 - Reduces the threat of catastrophic wildland fire, and reduces the risk of negative impacts to park resources in the event of a wildland fire.
 - Improves conditions for firefighter and public safety, and reduces suppression costs in the event of a wildland fire.
- Promote ecosystem sustainability.
- Restore and maintain the historic landscape.
- Manage all wildland fire incidents in accordance with accepted interagency standards, using appropriate management strategies and tactics, and maximizing efficiency via interagency coordination and cooperation.
- Maintain existing cooperative agreements with state and local agencies in order to facilitate close working relationships and mutual cooperation regarding fire management activities.
- Develop and conduct a monitoring program with recommended standard monitoring levels commensurate with the scope of the fire management program, and use the information gained to continually evaluate and improve the fire management program.
- Integrate knowledge gained through natural resource research into future fire management decisions and actions.
- Maintain the highest standards of professional and technical expertise in planning and safely implementing an effective fire management program.
- Plan and conduct all fire management activities in accordance with all applicable laws, policies and regulations.
- Incorporate the minimum impact suppression tactics policy into all suppression activities, to the greatest extent feasible and appropriate.

Resource management objectives addressed in Fort Frederica's 1997 Resource Management Plan (RMP) that are pertinent to fire management include:

- Preserve the fragile tabby, brick and earthwork remains at Fort Frederica and reduce, to the greatest degree possible, the effects of weathering, pollution, erosion, archeological looting and other adverse influences on the park's historic resources.
- Cooperate with government entities, community and civic associations and special interest groups to maintain the historical integrity of the park and to mitigate the potential

effects of development adjacent to the Monument through creative and innovative methods.

- Preserve the scenic and natural features of the Monument, including the townsite, Bloody Marsh, and their significant landscapes.

1.5 SCOPING ISSUES AND IMPACT TOPICS

On January 9, 2004, Fort Frederica National Monument announced to the public its intentions of creating a Fire Management Plan. The announcements were made through a scoping letter sent to seven individuals and organizations, and flyers placed for viewing at various public locations around town. The scoping letter mailing list was comprised of those people living immediately adjacent to the monument, as well as local officials and fire departments. The scoping letters and flyers both described the fire management activities outlined in the proposed Fire Management Plan and encouraged the public to provide their comments and concerns regarding the plan to the park via e-mail, telephone calls, or written correspondence. The public was also welcomed to visit the park office and speak personally with the appropriate staff members about the plan. As a result, on January 28 and 30, 2004, the park had two meetings, one with a park neighbor and one with the representative of the Glynn County Fire Department, respectively. Both parties expressed their support for the plan; however, the park neighbor expressed concerns of the plan's intended use of prescribed fire as a management tool. The major issues and concerns that came from these meeting determined to be important were those related to the effects of the proposed action, and those not already adequately addressed by laws, regulations, and policies. Important issues were considered in developing and evaluating the alternatives to the Proposed Action discussed in this EA.

1.5.1 *Issues Raised During Scoping Considered in this EA*

- Issue: Concerns were raised on how prescribed fire would affect the resident wildlife and nesting birds.
- Issue: Fear that prescribed fire would burn out of prescription and go beyond the park's boundary and onto neighboring private lands.

1.5.2 *Impact Topics Considered in this EA*

Impact topics are derived from issues raised during internal and external scoping. Not every conceivable impact of a proposed action is substantive enough to warrant analysis. The following topics, however, do merit consideration in this EA:

Soils: Low and moderate-severity fires can benefit soils through a fertilization effect, while high-intensity fires can damage soils; therefore, impacts to soils are analyzed in this EA.

Water Resources (including Floodplains): NPS policies require protection of water resources consistent with the Federal Clean Water Act. Thinning treatments, prescribed fires and fire

suppression efforts can adversely impact water quality (sediment delivery, turbidity); therefore, impacts to water resources are analyzed in this EA.

Vegetation: The area within the historic earthworks is vegetated by perennial grass with a scattering of mature live oaks. The surrounding woodland is dominated by pine, with some mixed hardwood. Thinning treatments, prescribed fires, and fire suppression efforts can impact vegetation communities and rare plant species; therefore, impacts to vegetation are analyzed in this EA.

Wildlife: There are resident populations of various species of reptiles, amphibians, birds, mammals, fish, and invertebrates that can be adversely and/or beneficially impacted by thinning treatments and prescribed fires. Therefore, impacts to wildlife are evaluated in this EA.

Threatened and Endangered Species: The Federal Endangered Species Act prohibits harm to any species of fauna or flora listed by the U. S. Fish and Wildlife Service (USFWS) as being either threatened or endangered. Such harm includes not only direct injury or mortality, but also disrupting the habitat on which these species depend. There are several threatened or endangered species that inhabit or may inhabit Fort Frederica National Monument, including the bald eagle (*Haliaeetus leucocephalus*), eastern indigo snake (*Dyrmarchon corais couperi*), gopher tortoise (*Gopherus polyphemus*), peregrine falcon (*Falco peregrinus anatum*), West Indian manatee (*Trichechus manatus*), and the wood stork (*Mycteria americana*). Therefore, impacts to T&E species are analyzed in this EA.

Air Quality: The federal 1970 Clean Air Act stipulates that federal agencies have an affirmative responsibility to protect a park's air quality from adverse air pollution impacts. All types of fires generate smoke and particulate matter, which can impact air quality within the park and surrounding region. In light of these considerations, air quality impacts are analyzed in this EA.

Visitor Use and Experience: The 1916 NPS Organic Act directs the Service to provide for public enjoyment of the scenery, wildlife and natural and historic resources of national parks "in such a manner and by such means as will leave them unimpaired for the enjoyment of future generations." Fire management activities can result in the short-term closure of certain areas and/or result in visual impacts that may affect the visitor use and experience of the park. Therefore, potential impacts of the proposed FMP on visitor use and experience are addressed in this EA.

Human Health and Safety: Wildland fires can be extremely hazardous, even life-threatening, to humans, and current federal fire management policies emphasize that firefighter and public safety is the first priority; all Fire Management Plans must reflect this commitment (NIFC, 1998). Therefore, impacts to human health and safety are addressed in this EA.

Cultural Resources: Section 106 of the National Historic Preservation Act of 1966, as amended, provides the framework for federal review and protection of cultural resources, and ensures that they are considered during federal project planning and execution. The park in its entirety is listed in the National Register of Historic Places, however, there is no Cultural Landscape Report for the Monument. The monumnet contains 19 brick, tabby, and earthen

remains of foundations and other structures that were part of the original settlement. In addition, thirty-one park structures are presently included on the List of Classified Structures (LCS). These cultural resources can be affected by fire itself and fire suppression activities; thus potential impacts to cultural resources are addressed in this EA.

Park Operations: Severe fires can potentially affect operations at national parks, especially in more developed sites like visitor centers, campgrounds, administrative and maintenance facilities. These impacts can occur directly from the threat to facilities of an approaching fire, and more indirectly from smoke and the diversion of personnel to firefighting. Fires have caused closures of facilities in parks around the country. Thus, the potential effects of the FMP alternatives on park operations will be considered in this EA.

1.5.3 Impact Topics Considered but dropped from Further Analysis

NEPA and the CEQ Regulations direct agencies to “avoid useless bulk...and concentrate effort and attention on important issues” (40 CFR 1502.15). Certain impact topics that are sometimes addressed in NEPA documents on other kinds of proposed actions or projects have been judged to not be substantively affected by any of the FMP alternatives considered in this EA. These topics are listed and briefly described below, and the rationale provided for considering them, but dropping them from further analysis.

Noise: Noise is defined as unwanted sound. Fuels reduction, prescribed fires and fire suppression efforts can all involve the use of noise-generating mechanical tools and devices with engines, such as chainsaws and trucks. Chainsaws, at close range, are quite loud (in excess of 100 decibels). The use of machines, such as chainsaws, would be infrequent in light of the limited thinning to be conducted on the park (on the order of hours, days, or at most weeks per year). This is not frequent enough to substantially interfere with human activities in the area or with wildlife behavior. Nor will such infrequent bursts of noise chronically impact the solitude and tranquility associated with the park. Therefore, this impact topic is eliminated from further analysis in this EA.

Waste Management: None of the FMP alternatives would generate noteworthy quantities of either hazardous or solid wastes that need to be disposed of in hazardous waste or general sanitary landfills. Therefore this impact topic is dropped from additional consideration.

Utilities: Generally speaking, some kinds of projects, especially those involving construction, may temporarily impact above and below-ground telephone, electrical, natural gas, water, and sewer lines and cables, potentially disrupting service to customers. Other proposed actions may exert a substantial, long-term demand on telephone, electrical, natural gas, water, and sewage infrastructure, sources, and service, thereby compromising existing service levels or causing a need for new facilities to be constructed. None of the FMP alternatives will cause any of these effects to any extent, and therefore utilities are eliminated from any additional analysis.

Land Use: Visitor and administrative facilities occur within the park. Fire management activities would not affect land uses within the park or in areas adjacent to it; therefore, land use is not included for further analysis in this EA.

Socio-economics: NEPA requires an analysis of impacts to the “human environment” which includes economic, social and demographic elements in the affected area. Fire management activities may bring a short-term need for additional personnel in the park, but this addition would be minimal and would not affect the neighboring community’s overall population, income and employment base. Therefore, this impact topic is not included for further analysis in this EA.

Transportation: None of the FMP alternatives would substantively affect road, railroad, water-based, or aerial transportation in and around the park. One exception to this general rule would be the short-term closure of nearby roads during fire suppression activities or from smoke emanating from wildland fires or prescribed fires. Over the long term, such closures would not significantly impinge local traffic since they would be both very infrequent, and, in the case of prescribed fire, of short duration (on the magnitude of 1-2 hours). Moreover, the vegetation in the prescribed fire units (predominantly grasses and a few shrubs, some woody debris) do not produce heavy quantities of smoke when burned. Therefore, this topic is dismissed from any further analysis.

Environmental Justice / Protection of Children: Presidential Executive Order 12898 requires federal agencies to identify and address disproportionate impacts of their programs, policies and activities on minority and low-income populations. Executive Order 13045 requires federal actions and policies to identify and address disproportionately adverse risks to the health and safety of children. None of the alternatives would have disproportionate health or environmental effects on minorities or low-income populations as defined in the Environmental Protection Agency’s Environmental Justice Guidance; therefore, these topics are not further addressed in this EA.

Indian Trust Resources: Indian trust assets are owned by Native Americans but held in trust by the United States. Indian trust assets do not occur within Fort Frederica National Monument and, therefore, are not evaluated further in this EA.

Prime and Unique Agricultural Lands: Prime farmland has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. Unique land is land other than prime farmland that is used for production of specific high-value food and fiber crops. Both categories require that the land is available for farming uses. There are no prime and unique agricultural lands within the boundaries of Fort Frederica National Monument; therefore, this impact topic is not evaluated further in this EA.

Wilderness: According to National Park Service Management Policies (2001), proposals having the potential to impact wilderness resources must be evaluated in accordance with National Park Service procedures for implementing the National Environmental Policy Act. Since there are no proposed or designated wilderness areas within or adjacent to the park, wilderness impacts are not further evaluated in this EA.

Resource Conservation, Including Energy, and Pollution Prevention: The National Park Service’s *Guiding Principles of Sustainable Design* provides a basis for achieving sustainability

in facility planning and design, emphasizes the importance of biodiversity, and encourages responsible decisions. The guidebook articulates principles to be used such as resource conservation and recycling. Proposed project actions would not minimize or add to resource conservation or pollution prevention on the park and, therefore, this impact topic is not evaluated further in this EA.

Table 1-1 Impact Topics for Fort Frederica National Monument Fire Management Plan EA

Impact Topic	Retained or Dismissed from Further Evaluation	Relevant Regulations or Policies
Soils	Retained	NPS <i>Management Policies 2001</i>
Water Resources	Retained	Clean Water Act; Executive Order 12088; NPS <i>Management Policies</i>
Floodplains and Wetlands	Retained	Executive Order 11988; Executive Order 11990; Rivers and Harbors Act; Clean Water Act; NPS <i>Management Policies</i>
Vegetation	Retained	NPS <i>Management Policies</i>
Wildlife	Retained	NPS <i>Management Policies</i>
Threatened and Endangered Species and their Habitats	Retained	Endangered Species Act; NPS <i>Management Policies</i>
Air Quality	Retained	Federal Clean Air Act (CAA); CAA Amendments of 1990; NPS <i>Management Policies</i>
Visitor Use and Experience	Retained	NPS <i>Management Policies</i>
Human Health & Safety	Retained	NPS <i>Management Policies</i>
Cultural Resources	Retained	Section 106; National Historic Preservation Act; 36 CFR 800; NEPA; Executive Order 13007; Director's Order #28; NPS <i>Management Policies</i>
Park Operations	Retained	NPS <i>Management Policies</i>
Noise	Dismissed	NPS <i>Management Policies</i>
Waste Management	Dismissed	NPS <i>Management Policies</i>
Utilities	Dismissed	NPS <i>Management Policies</i>
Land Use	Dismissed	NPS <i>Management Policies</i>
Socioeconomics	Dismissed	40 CFR Regulations for Implementing NEPA; NPS <i>Management Policies</i>
Transportation	Dismissed	NPS <i>Management Policies</i>
Environmental Justice	Dismissed	Executive Order 12898
Indian Trust Resources	Dismissed	Department of the Interior Secretarial Orders No. 3206 and No. 3175
Prime and Unique Agricultural Lands	Dismissed	Council on Environmental Quality 1980 memorandum on prime and unique farmlands
Wilderness	Dismissed	The Wilderness Act; Director's Order #41; NPS <i>Management Policies</i>
Resource Conservation, Including Energy, and Pollution Prevention	Dismissed	NEPA; NPS <i>Guiding Principles of Sustainable Design</i> ; NPS <i>Management Policies</i>



Figure 1-1 Fort Frederica National Monument Vicinity

Chapter 2 - Issues and Alternatives

This chapter describes the range of alternatives, including the Proposed Action and No Action Alternatives, formulated to address the purpose of and need for the proposed project. These alternatives were developed through evaluation of the comments provided by individuals, organizations, governmental agencies, and the Interdisciplinary Team (IDT).

2.1 ALTERNATIVES CONSIDERED BUT NOT ANALYZED FURTHER IN THIS EA

2.1.1 *Fire Management Plan to include Wildland Fire Use*

Wildland fire use involves the management of fires ignited by natural means (usually lightning) that are permitted to burn under specific environmental conditions for natural resource benefits. In many cases, national parks and forests employ wildland fire use as a part of their fire management program to obtain natural resource benefits from wildland fire. These parks and forests typically have large acreages and the areas identified for its use contain few if any private residences and structures nearby (wildland urban interface). In such cases, wildland fire use is a critical component in meeting fire management objectives of federal agencies. This alternative was considered but not analyzed further in this EA due to the current authorized boundary of the park (250 acres) being too small to ensure fire containment within park boundaries, staffing limitations, and the close proximity of urban development in the vicinity of the park. Park staff concluded that the potential risks to human health and safety and natural/cultural resources under this alternative outweigh any potential resource benefits that would be obtained from including wildland fire use into the Fire Management Plan.

2.2 ALTERNATIVES CONSIDERED AND ANALYZED IN THIS EA

2.2.1 *Fire Management Units*

For the following three alternatives, Fort Frederica National Monument has been divided into four Fire Management Units (FMU) to facilitate the achievement of its fire management objectives (see Figure 2-1). An FMU is any land management area definable by objectives, topographic features, access, values-to-be-protected, political boundaries, fuel types, or major fire regimes, etc., that sets it apart from management characteristics of an adjacent unit. FMUs are delineated in Fire Management Plans (FMP). These units may have dominant management objectives and pre-selected strategies assigned to accomplish these objectives. (NPS, 1999).

- FMU #1 is the upland portion of the main park unit and contains approximately 112 acres.
- FMU #2 is the marsh portion of the main park unit, located on the eastern side of the Frederica River. It contains approximately 53 acres.

- FMU #3 is the marsh portion of the main park unit, located on the western side of the Frederica River. It contains approximately 116 acres.
- FMU #4, the detached Battle of Bloody Marsh unit, is located approximately six miles to the south of the main park unit. It contains about seven and a half acres.

2.2.2 *Alternative 1 (No Action Alternative) - Fire Management Plan to Include Wildland Fire Suppression, Manual/Mechanical Thinning Treatments*

Under this alternative, the park would continue with its current process of fire management. The Fire Management Plan would include the suppression of all wildland fires and allow for manual/mechanical treatments. Management objectives for FMU 1 would include:

- Conduct initial attack within 5-10 minutes (response time for the Glynn County Fire Department) of the time a wildland fire report is received.
- Control 95% or higher of all wildland fires during initial attack.

Because FMUs 2 and 3 are primarily made up of marsh lands, making wildland fire suppression difficult, the management objective would include:

- As per the statewide reciprocal fire protection memorandum of understanding between the U.S. Department of the Interior and the Georgia Forestry Commission (GFC), cooperate with the GFC to confine any wildland fire involving FMUs 2 or 3 within state- and park-owned property boundaries.

Management objectives for FMU 4 would include:

- Conduct initial attack within 15-20 minutes (response time for the Glynn County Fire Department) of the time a wildland fire report is received.
- Control 95% or higher of all wildland fires during initial attack.
- In the case of a wildland fire involving the marsh portion of FMU 4, as per the statewide reciprocal fire protection memorandum of understanding between the U.S. Department of the Interior and the Georgia Forestry Commission (GFC), cooperate with the GFC to confine any wildland fire within state- and park-owned property boundaries.

Under this alternative, all wildland fires in the park, regardless of origin, would be declared wildland fires and suppressed in a manner that minimizes negative environmental impacts of suppression activities. Examples of suppression tactics that may cause environmental harm include building of firelines and the excessive cutting of trees. All wildland fire suppression activities would adhere to Minimum Impact Suppression Tactics (MIST) guidelines as outlined in Section 2.3 *Mitigation Measures and Monitoring*. Manual and mechanical thinning (e.g. chainsaws, bush hogs) would be utilized to maintain open areas and historic vistas, promote exotic vegetation species

control, and create/maintain defensible space of at least 30 feet around all park buildings. While a few large diameter hazard trees may be cut, thinning efforts would focus primarily on small diameter woody shrubs and trees. Mechanical thinning efforts would also include mowing.

2.2.3 Alternative 2 - *Fire Management Plan to Include Wildland Fire Suppression, Mechanical Thinning Treatment, and Hazard Fuels Reduction*

Under this alternative, all wildland fires in the park, regardless of origin, would be declared wildland fires and suppressed in a manner that minimizes negative environmental impacts of suppression activities. All wildland fire suppression activities would adhere to Minimum Impact Suppression Tactics (MIST) guidelines as outlined in Section 2.3 *Mitigation Measures and Monitoring*.

Non-fire fuels management at the park includes mechanical thinning techniques to maintain open areas and historic vistas, to reduce hazard fuels accumulations, and to create and/or maintain defensible space of at least 30 feet around all park buildings.

Hazard fuels reduction at the park would be conducted in association with the Wildland Urban Interface Initiative. Hazard fuels accumulations would be mechanically reduced along two sections of the main park unit perimeter, bordering residential and commercial property, for a total of approximately 2,055 linear feet and 1.6 acres. (These two fuels breaks would additionally serve as holding lines for prescribed fire.) The northern perimeter fuel break would be created by bush hogging/chainsawing a 12-foot wide corridor along the perimeter itself, and mechanically reducing (selectively thinning by chainsaw) hazard fuels accumulations inside of that corridor for an additional 30 feet, creating a shaded fuel break. A ~12-foot wide driveway runs along the majority (approximately 745 linear feet) of the southern park perimeter. Where the driveway does not exist, a 12-foot wide corridor would be chainsawed/bush hogged along the perimeter itself (approximately 160 linear feet). Hazard fuels would be mechanically reduced (selectively thinned by chainsaw) inside of that break and inside of the driveway for an additional 30 feet, creating a shaded fuel break.

Condition Class: an expression of the departure of the current condition from the historical fire regime.

Condition Class 1 – Fire regimes are within an historical range, and the risk of losing key ecosystem components is low. Vegetation attributes (species composition and structure) are intact and function within an historical range.

Condition Class 2 – Fire regimes have been moderately altered from their historical range. The risk of losing key ecosystem components is moderate. Fire frequencies have departed from historical frequencies by one or more return intervals (either increased or decreased). This results in moderate changes to one or more of the following: fire size, intensity and severity, and landscape patterns. Vegetation attributes have been moderately altered from their historical range. Where appropriate, these areas may need moderate levels of restoration treatments, such as fire use and hand or mechanical treatments, to be restored to the historical fire regime.

Condition Class 3 – Fire regimes have been significantly altered from their historical range. The risk of losing key ecosystem components is high. Fire frequencies have departed from historical frequencies by multiple return intervals. This results in dramatic changes to one or more of the following: fire size, intensity, severity, and landscape patterns. Vegetation attributes have been significantly altered from their historical range. Where appropriate, these areas may need moderate levels of restoration treatments, such as hand or mechanical treatments, before fire can be used to restore the historical fire regime (Schmidt, et al, 2000).

Hazard fuels accumulations would be mechanically (bush hogged/chainsawed) reduced to create and maintain a 30-foot radius of defensible space around a black powder magazine and a loading shed, both under construction at the time of this writing. Total area affected would be approximately .2 acre.

In all cases, fuels considered to be “hazards” would primarily be dead and down timber, ladder fuels, undergrowth and fallen limbs, briars, and brush/timber of less than 6 inches dbh (diameter at breast height). Remaining live trees would be limbed to approximately 12 feet from the base of tree. All down trees larger than 24 inches in diameter may remain in the fuel break, but must lie flush to the ground, with limbs cut and removed. All debris would be hauled from the park to an approved location. See figure 2-1 for the treatment locations.

Table 2-1 Five-Year Mechanical Schedule

Treatment Unit Name	Timing of Treatment	Treatment Type	Unit Description (General Fuel Types)
Northern Perimeter Fuels Break (1,150 linear feet, 1.1 acres)	Initial, 2005; maintenance as needed thereafter	Combination of bush hogging and selective thinning (e.g. chainsaws)	Grass/forbs/litter/underbrush beneath open pine; Condition class 2 (see text box on following page)
Southern Perimeter Fuels Break (905 linear feet, .54 acres)			
Black Powder Magazine Defensible Space (.1 acre)			
Loading Shed Defensible Space (.1 acre)			

2.2.4 Alternative 3 (Preferred Alternative) - *Fire Management Plan to Include Wildland Fire Suppression, Mechanical Thinning Treatment, Prescribed Fire, and Hazard Fuels Reduction*

Under this alternative, wildland fire suppression, mechanical thinning treatments, and hazard fuels reduction treatments would be conducted in the same manner as in Alternative 2.

Fire management objectives would be expanded to include prescribed fire as a tool to reduce hazard fuels, promote ecosystem sustainability, and to restore and maintain the historic landscape. Prescribed fire would be utilized on one approximately 76-acre treatment unit, would occur between February and April, and have a return interval of 3 to 5 years (see Table 2-2). See Figure 2-1 for the treatment location. The general fuels types found within this treatment unit are leaf litter, grasses, forbs, and brush, located underneath open stands of pine. The pine stands are considered to be in condition class 2 (see textbox for condition class definitions).

2.2.5 *Environmentally Preferred Alternative*

The National Park Service is required to identify the environmentally preferred alternative(s) for any of its proposed projects. That alternative is the alternative that will promote the national environmental policy expressed in NEPA (Section 101 (b)). This includes alternatives that:

- 1) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;

- 2) ensure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings;
- 3) attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;
- 4) preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice;
- 5) achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities; and
- 6) enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

In essence, the environmentally preferred alternative would be the one(s) that “causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources” (CEQ, 1978).

In this case, Alternative 3 is the environmentally preferred alternative for Fort Frederica National Monument since it best meets goals 1, 2, 3, and 4 described above. Under this alternative, fire management activities would restore and maintain native plant communities in the park, mimic the natural ecological processes, and help protect park resources and adjacent lands from the threat of wildland fires. Finally, the alternative best protects and helps preserve the historic, cultural, and natural resources in the park for current and future generations.

2.3 MITIGATION MEASURES AND MONITORING

Fort Frederica National Monument will collect information on fuel reduction efforts, vegetative resources, and other objective-dependent variables after a wildland fire. During fire events (wildland or prescribed fire), data will be collected regarding the current fire conditions consistent with the variables identified in a prescribed fire plan, such as fuel and vegetation type, anticipated fire behavior and fire spread, current and forecasted weather, smoke volume and dispersal, etc.

Upon implementation of a prescribed fire program, the park will coordinate with the Southeast Regional Office Fire Ecologist to establish monitoring plots at select locations within the park. The Natchez Trace Fire Effects Team will conduct short-term change and long-term change monitoring of these plots and complete associated documentation. Short-term change monitoring, also known as Level 3 monitoring in the NPS *Fire Monitoring Handbook* (2001), provides information on vegetative change within a specific vegetation or fuel complex. Long-term change monitoring, also known as Level 4 monitoring, typically involves a continuation of Level 3 monitoring at the same permanent transects or plots, and serves to identify trends that can guide management decisions. The information gathered will be used as feedback to make any necessary refinements or changes to the prescribed fire objectives and prescriptions in place

at the park. The monitoring program will continue to be refined as more intelligence is gathered through research regarding the role of fire in the various park vegetation communities.

Mitigation measures are prescribed to prevent and/or mitigate adverse environmental impacts that may occur from fire management activities. Mitigation measures are common to all alternatives.

2.3.1 *Fire Management Activities*

- Keeping fire engines on existing roads.
- Restricting the use of heavy equipment for constructing fireline. Not using fireline explosives.
- Using existing natural fuel breaks and human-made barriers, wet line, or cold trailing the fire edge in lieu of fireline construction whenever possible.
- Keeping fireline width as narrow and shallow as possible when it must be constructed.
- Avoiding ground disturbance within known natural and archeological/cultural/historic resource locations. When fireline construction is necessary in proximity to these resource locations it will involve as little ground disturbance as possible and be located as far outside of resource boundaries as possible.
- Using water in lieu of fire retardant.
- Using soaker hose, sprinklers or foggers in mop-up; avoiding boring and hydraulic action.
- Minimizing cutting of trees.
- Scattering or removing debris as prescribed by the incident commander.
- Protecting air and water quality by complying with the Clean Air Act, the Clean Water Act, and all other applicable federal, state, and local laws and requirements.

2.3.2 *Human Health and Safety*

- Firefighter and public safety is the highest priority in every fire management activity. In light of this:
 - Only fully qualified (i.e. meeting NPS qualifications and accepted interagency knowledge, skills and abilities for the assigned fire job), employees will be assigned fire management duties (unless assigned as trainees, in which case they will be closely supervised by an individual fully qualified for the given position).
 - No fire management operation will be initiated until all personnel involved have received a safety briefing describing known hazards and mitigating actions (LCES), current fire season conditions, and current and predicted fire weather and behavior. Hazards specific to the park include:
 - Snags and dead trees with weak root systems.
 - Stinging/biting insects, ticks, and poisonous snakes.
 - Dehydration, heat exhaustion and heat stroke.
 - Wildland fire incident commanders will minimize firefighter exposure to heavy smoke by incorporating the recommendations outlined in the publication *Health*

Hazards of Smoke (Sharkey 1997), available from the Missoula Technology and Development Center.

- Park neighbors, visitors and local residents will be notified of all planned and unplanned fire management events that have the potential to impact them.
- The park superintendent or designee may, as a safety precaution, temporarily close all or part of the park to the visiting public.
- Fire weather forecasts will be used to correlate prescribed fire ignitions with periods of optimal combustion and smoke dispersal. Any smoke situation that arises and threatens any smoke-sensitive areas will entail immediate suppression action.
- Smoke on roadways will be monitored and traffic control provisions taken to ensure motorist safety during fire events at the park. The following procedures will be taken to compensate for reduced visibility when a paved road is affected by smoke (the incident commander on a particular event will determine visibility levels):
 - Posting of “Smoke on Road” signs on either side of the affected area.
 - Reducing the posted speed limit when visibility is strongly reduced, and escorting vehicles as necessary.
 - Closing the road to traffic when visibility is severely reduced.

2.3.3 Property

- To the greatest extent feasible and appropriate, park infrastructure, any other development, and adjacent non-agency land will be protected during all fire management activities.

2.3.4 Cultural Resources

- Cultural resources will be protected from the adverse effects of unwanted fire as well as the adverse effects of fire management activities. During all suppression activities, the minimum impact suppression tactics policy will be incorporated to the greatest extent feasible and appropriate, employing methods least damaging to park resources for the given situation.
- The park will incorporate archeological/cultural/historic resources protection into fire management in a variety of ways. For example:
 - The park FMO will coordinate with the Southeast Archeological Center to ensure that Fort Frederica has the most current data regarding archeological resources within its boundaries. S/he will provide recommendations on how to mitigate adverse effects to these resources during fire management activities, and will

coordinate compliance with Section 106 of the National Historic Preservation Act, as appropriate.

- Historic features, including foundations, structure remains, and above-ground burial vaults, will be protected from wildland fire via mowing of the grass around them.
- During all suppression activities, the minimum impact suppression tactics policy will be incorporated to the greatest extent feasible and appropriate for the given situation. Tactics directly or indirectly facilitating the protection of archeological/cultural/historic resources include:
 - Keeping fire engines or slip-on units on existing roads.
 - Not using heavy equipment (e.g. bulldozers, plows) for constructing fireline.
 - Not using fireline explosives.
 - Using existing natural fuel breaks and human-made barriers, wet line, or cold trailing the fire edge in lieu of fireline construction whenever possible.
 - Keeping fireline width as narrow as possible when it must be constructed.
 - Avoiding ground disturbance within known archeological/cultural/historic resource locations. When fireline construction is necessary in proximity to these resource locations it will involve as little ground disturbance as possible and be located as far outside of resource boundaries as possible.
 - Using soaker hose, sprinklers or foggers in mop-up; avoiding boring and hydraulic action.

2.3.5 Natural Resources

- The park will incorporate natural resources protection into fire management in a variety of ways, including minimum impact suppression tactics used in protecting cultural resources with additional tactics including:
 - Avoiding ground disturbance within known natural resource locations. When fireline construction is necessary in proximity to these resource locations it will involve as little ground disturbance as possible and be located as far outside of resource boundaries as possible.
 - Using water in lieu of fire retardant.
 - Minimizing cutting of trees.
 - Protecting air and water quality by complying with the Clean Air Act, the Clean Water Act, and all other applicable federal, state, and local laws and requirements.

2.3.6 Air and Water Quality

- The park will comply with the Clean Air Act, the Clean Water Act, and all other applicable federal, state, and local laws and requirements. Additionally:
 - The suppression response selected to manage a wildland fire will consider air quality standards.
 - During fire suppression, water will be used in lieu of fire retardant.

2.4 IMPACT DEFINITIONS

Table 2-2 depicts the impact definitions used in this Environmental Assessment. Significant impact thresholds for the various key resources were determined in light of compliance with existing state and federal laws, and compliance with existing Fort Frederica National Monument planning documents.

Table 2-2 Impact Definitions

Key Resources	“Minor” Impact	“Moderate” Impact	“Major” Impact	Duration
Soils	The effects to soils would be detectable, but likely short-term. Damage to or loss of the litter/humus layers that causes slight localized increases in soil loss from erosion; effects to soil productivity or fertility would be small, as would the area affected; short-term and localized compaction of soils that does not prohibit re-vegetation; if mitigation were needed to offset adverse effects, it would be relatively simple to implement and likely successful	The effect on soil productivity or fertility would be readily apparent, long-term, and result in a change to the soil character over a relatively wide area; fire severe enough to cause a noticeable change in soil community; intermittent areas of surface sterilization of soils that may cause some long-term loss of soil productivity that may alter a portion of the vegetation community; short- to long-term and localized compaction of soils that may prohibit some re-vegetation; mitigation measures would probably be necessary to offset adverse effects and would likely be successful	The effect on soil productivity or fertility would be readily apparent, long-term, and substantially change the character of the soils over a large area in and out of the park. Damage to or loss of the litter/ humus layers that would increase soil loss from erosion on a substantial portion of the burn area; fire severe enough to cause substantial damage to the soil community; substantial surface sterilization of soils that may cause long-term loss of soil productivity and that may alter or destroy the vegetation community over most of the burned area; long-term and widespread soil compaction that affects a large number of acres and prohibits re-vegetation; mitigation measures to offset adverse effects would be needed, extensive, and their success could not be guaranteed	<u>Short-Term</u> Recovers in less than 3 years <u>Long-Term</u> Takes more than 3 years to recover
Water Resources (Including Wetlands and Floodplains)	Changes in water quality would be measurable, although small, likely short-term, and localized; riparian impacts that do not substantially increase stream temperatures or affect stream habitats; no alteration of natural hydrology of wetlands; a U.S. Army Corps of Engineers 404 permit would not be required; no filling or disconnecting of the floodplain; short-term impacts that do not affect the functionality of the floodplain; no mitigation measure associated with water quality would be necessary	Changes in water quality would be measurable and long-term but would be relatively local; localized and indirect riparian impacts that may slightly increase stream temperatures or affect stream habitats; alteration of natural hydrology of wetlands would be apparent such that a U.S. Army Corps of Engineers 404 permit could be required; alteration of the floodplain apparent; wetland or floodplain functions would not be affected in the long-term; mitigation measures associated with water quality or hydrology would be necessary and the measures would likely succeed	Changes in water quality would be readily measurable, would have substantial consequences, and would be noticed on a regional scale; localized and indirect riparian impact that may substantially increase stream temperatures or affect stream habitats; effects to wetlands or floodplains would be observable over a relatively large area and would be long-term, and would require a U.S. Army Corps of Engineers 404 permit; filling or disconnecting of the floodplain; long-term impacts that affect the functionality of the floodplain; mitigation measures would be necessary and their success would not be guaranteed	<u>Short-Term</u> Recovers in less than 1 year <u>Long-Term</u> Takes more than 1 year to recover

Key Resources	“Minor” Impact	“Moderate” Impact	“Major” Impact	Duration
Vegetation	Temporarily affect some individual native plants and would also affect a relatively small portion of that species’ population; short-term changes in plant species composition and/or structure, consistent with expected successional pathways of a given plant community from a natural disturbance event; increase in invasive species in limited locations; occasional death of a canopy tree; mitigation to offset adverse effects, including special measures to avoid affecting species of special concern, could be required and would be effective	The effect on some individual native plants and would also affect a sizeable segment of the species’ population in the long-term and over a relatively large area; long-term changes in plant species composition and/or structure, consistent with expected successional pathways of a given plant community from a natural disturbance event; widespread increase in invasive species that does not jeopardize native plant communities; repeated death of canopy trees; mitigation to offset adverse effects could be extensive, but would likely be successful; some species of special concern could also be affected	Considerable long-term effect on native plant populations, including species of special concern, and affect a relatively large area in and out of the park; violation of the Endangered Species Act of 1973; widespread increase in invasive species that jeopardizes native plant communities; mitigation measures to offset the adverse effects would be required, extensive, and success of the mitigation measures would not be guaranteed	<p>Short-Term Recovers in less than 3 years</p> <p>Long-Term Takes more than 3 years to recover</p>
Wildlife	Short-term displacement of a few localized individuals or groups of animals; mortality of individuals of species not afforded special protection by state and/or federal law; mortality of individuals that would not impact population trends; mitigation measures, if needed to offset adverse effects, would be simple and successful	Effects to wildlife would be readily detectable, long-term and localized, with consequences affecting the population level(s) of specie(s); mitigation measures, if needed to offset adverse effects, would be extensive and likely successful	Effects to wildlife would be obvious, long-term, and would have substantial consequences to wildlife populations in the region; violation of the Endangered Species Act of 1973; mortality of a number of individuals that subsequently jeopardizes the viability of the resident population; extensive mitigation measures would be needed to offset any adverse effects and their success would not be guaranteed	<p>Short-Term Recovers in less than 1 year</p> <p>Long-Term Takes more than 1 year to recover</p>
Air Quality	Changes in air quality would be measurable, although the changes would be small, short-term, and the effects would be localized; short-term and limited smoke exposure to sensitive resources; No air quality mitigation measures would be necessary	Changes in air quality would be measurable, would have consequences, although the effect would be relatively local; all air quality standards still met; short-term exposure to sensitive resources; air quality mitigation measures would be necessary and the measures would likely be successful	Changes in air quality would be measurable, would have substantial consequences, and be noticed regionally; violation of state and federal air quality standards; violation of Class II air quality standards; prolonged smoke exposure to sensitive receptors; air quality mitigation measures would be necessary and the success of the measures could not be guaranteed	<p>Short-Term Recovers in 7 days or less</p> <p>Long-Term Takes more than 7 days to recover</p>

Key Resources	“Minor” Impact	“Moderate” Impact	“Major” Impact	Duration
<p>Visitor Use & Experience</p>	<p>Short-term displacement of recreationists or closure of trails and recreation areas during off-peak recreation use; temporary or short-term alteration of the vista, or temporary presence of equipment in localized area; smoke accumulation during off-peak recreation use; the visitor would be aware of the effects associated with the alternative, but the effects would be slight</p>	<p>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</p>	<p>Permanent closure of trails and recreation areas; conflict with peak recreation use; long-term change in scenic integrity of the vista; substantive smoke accumulation during peak recreation use; the visitor would be aware of the effects associated with the alternative and would likely express a strong opinion about the changes</p>	<p>Short-Term Occurs only during the treatment effect</p> <p>Long-Term Occurs after the treatment effect</p>
<p>Human Health & Safety</p>	<p>The effect would be detectable and short-term, but would not have an appreciable effect on public health and safety; potential for small injuries to any worker or visitor (e.g. scrapes or bruises); limited exposure to hazardous compounds or smoke particulates at concentrations below health-based levels; if mitigation were needed, it would be relatively simple and likely successful</p>	<p>The effects would be readily apparent and long-term, and would result in substantial, noticeable effects to public health and safety on a local scale; non-life-threatening injuries to any worker or visitor; limited exposure to hazardous compounds or smoke particulates at concentrations at or slightly above health-based levels; mitigation measures would probably be necessary and would likely be successful</p>	<p>The effects would be readily apparent and long-term, and would result in substantial noticeable effects to public health and safety on a regional scale; serious life-threatening injuries to any worker or member of the public; limited or prolonged exposure to hazardous compounds or smoke particulates at concentrations well above health-based levels; extensive mitigation measures would be needed, and their success would not be guaranteed</p>	<p>Short-Term Occurs only during the treatment effect</p> <p>Long-Term Occurs after the treatment effect</p>
<p>Cultural Resources</p>	<p>For archeological resources, the impact affects an archeological site(s) with modest data potential and no significant ties to a living community's cultural identity; temporary, non-adverse effects to registered cultural resource sites, eligible cultural resource sites, sites with an undetermined eligibility, and traditional cultural properties; no effect to the character-defining features of a National Register of Historic Places eligible or listed structure, district, or cultural landscape</p>	<p>For archeological resources, the impact affects an archeological site(s) with high data potential and no significant ties to a living community's cultural identity; temporary adverse effects to registered cultural resource sites, eligible cultural resource sites, sites with an undetermined eligibility, and traditional cultural properties, but would not diminish the integrity of the cultural resource to the extent that its National Register eligibility is jeopardized</p>	<p>For archeological resources, the impact affects an archeological site(s) with exceptional data potential or that has significant ties to a living community's cultural identity; long-term adverse impacts to registered cultural resource sites, eligible cultural resource sites, sites with an undetermined eligibility, and traditional cultural properties that would diminish the integrity of the cultural resource to the extent that its National Register eligibility is jeopardized</p>	<p>Short-Term Treatment effects on the natural elements of a cultural landscape (e.g., three to five years until new vegetation returns)</p> <p>Long-Term Because most cultural resources are non-renewable, any effects would be long term</p>

Key Resources	“Minor” Impact	“Moderate” Impact	“Major” Impact	Duration
Park Operations	The effect would be detectable and likely short-term, but would be of a magnitude that would not have an appreciable effect on park operations; short-term suspension of non-critical park operations; negligible impact to park buildings and structures; if mitigation were needed to offset adverse effects, it would be relatively simple and likely successful	The effects would be readily apparent, be long-term, and would result in a substantial change in park operations in a manner noticeable to staff and the public; long-term suspension of all park operations (1 to 2 days); detectable adverse impacts to park buildings and structures; mitigation measures would probably be necessary to offset adverse effects and would likely be successful	The effects would be readily apparent, long-term, would result in a substantial change in park operations in a manner noticeable to staff and the public and be markedly different from existing operations; prolonged suspension of all park operations; substantial adverse impacts to park buildings and structures; mitigation measures to offset adverse effects would be needed, would be extensive, and their success could not be guaranteed.	Short-Term Effects lasting for the duration of the treatment action Long-Term Effects lasting longer than the duration of the treatment action.

2.5 COMPARISON OF ALTERNATIVES

Table 2-3 briefly summarizes the environmental effects of the various alternatives. It provides a quick comparison of how well the alternatives respond to the project need, objectives, important issues and impact topics. Chapter 3 discusses the environmental consequences of the proposed alternatives in detail.

Project Need	Alternative 1 - No Action Alternative	Alternative 2 – Suppress Wildland Fires, Thinning Treatments, Hazard Fuels Reduction	Alternative 3 – Suppress Wildland Fires and Employ Thinning, Prescribed Fire Treatments
Restore and protect the historic landscape	Yes, thinning activities would protect the historic landscape by stopping encroachment of woody trees and shrubs in open fields, historic vistas; earthworks would be maintained with the removal of woody vegetation and trees	Yes, thinning activities would protect the historic landscape by stopping encroachment of woody trees and shrubs in open fields, historic vistas; earthworks would be maintained with the removal of woody vegetation and trees	Yes, thinning and prescribed fire activities would protect the historic landscape by stopping encroachment of woody trees and shrubs in open fields, historic vistas; earthworks would be maintained with the removal of woody vegetation and trees
Reduces hazard fuels	Yes, hazard fuels reduction achieved and maintained over time	Yes, hazard fuels reduction achieved and maintained over time. Hazard fuels breaks totaling approximately 2 acres would be created along those portions of the park’s boundary where they currently do not exist; additional defensible space created around the black powder magazine and loading shed	Yes, hazard fuels reduction achieved and maintained over time. Hazard fuels breaks totaling approximately 2 acres would be created along those portions of the park’s boundary where they currently do not exist; additional defensible space created around the black powder magazine and loading shed; prescribed fire would reduce hazard fuels on an additional 76 acres

	Alternative 1 - No Action Alternative	Alternative 2 – Suppress Wildland Fires, Thinning Treatments, Hazard Fuels Reduction	Alternative 3 – Suppress Wildland Fires and Employ Thinning, Prescribed Fire Treatments
Important Issues			
Potential escape of prescribed fire	No potential for escape of prescribed fire since there would be no prescribed fires	No potential for escape of prescribed fire since there would be no prescribed fires	This alternative allows for prescribed fire; however, potential for escape would be minimal in light of mitigation measures and adherence to guidelines and procedures for ignition of prescribed fire.
Impact Topics			
Geology and Soils	Very minor short-term soil erosion impacts resulting from thinning activities	Very minor short-term soil erosion impacts resulting from thinning, from maintaining and creating hazard fuels breaks and hazard fuels reduction, and fire suppression activities	Very minor, localized and short-term soil erosion impacts; decreased potential for high-severity fire in the future and direct soil impacts
Water Resources (including floodplains)	No water resources impacts	Minor water resources impacts resulting from runoff from maintaining and creating hazard fuels breaks and hazard fuels reduction, and fire suppression activities	Minor water resources impacts from runoff resulting from maintaining and creating hazard fuels breaks and prescribed fire use; benefits to soil development and soil nitrification with prescribed fire use
Vegetation	Vegetative benefits resulting from historic fire regime not realized; fire management activities resulting in ground disturbance could result in the spread of invasive exotic plants species	Vegetative benefits resulting from historic fire regime not realized; fire management activities resulting in ground disturbance could result in the spread of invasive exotic plants species	Plant habitat and diversity improved with prescribed fire use; native vegetation favored; invasive exotic plant species reduced; fuel loadings reduced; fire management activities resulting in ground disturbance could result in the spread of noxious weeds
Wildlife	Thinning activities would temporarily displace some wildlife species; individual mortality of some species likely; no impact on federal and/or state T&E species; minor impacts to migratory bird habitat from thinning of encroaching trees and shrubs	Thinning activities would temporarily displace some wildlife species; individual mortality of some species likely; no impact on federal and/or state T&E species; minor impacts to migratory bird habitat from thinning of encroaching trees and shrubs	Thinning, hazard fuels reduction, and prescribed fire activities would temporarily displace some wildlife species; individual mortality of some species likely; no impact on federal and/or state T&E species; minor impacts to migratory bird habitat from thinning of encroaching trees and shrubs
Air Quality	No air quality impacts	No air quality impacts	Very minor and short-term effects resulting from prescribed fire; very minor, if any, smoke impacts on sensitive receptors

	Alternative 1 - No Action Alternative	Alternative 2 – Suppress Wildland Fires, Thinning Treatments, Hazard Fuels Reduction	Alternative 3 – Suppress Wildland Fires and Employ Thinning, Prescribed Fire Treatments
Visitor Use and Experience (including Park Operations)	Minor and short-term impacts during thinning activities (e.g. trail or road closures, presence of work crews in the vista); no effect on park operations	Minor and short-term impacts during hazard fuels reduction (e.g. trail or road closures, presence of work crews in the vista); no effect on park operations	Minor and short-term impacts during thinning, hazard fuels reduction, and prescribed fire activities (e.g. trail or road closures, presence of work crews in the vista); no effect on park operations; potential for short-term closure of areas of the park
Human Health & Safety	Human health and safety marginally improved with limited decrease in hazard fuels; potential for injury from thinning activities and fire suppression activities	Human health and safety improved with decreased fire danger to the park and adjacent communities with creation and maintenance of hazard fuels break; potential for injury from thinning activities and fire suppression activities	Human health and safety improved by reducing fire danger to the park and adjacent communities; potential for injury from thinning activities, fire suppression activities; very minor exposure to smoke by workers and the public during prescribed fire
Cultural Resources	No direct impact to known cultural resources; potential for impacts to un-recorded sites	No direct impact to known cultural resources; potential for impacts to un-recorded sites	No direct impact to known cultural resources; potential for impacts to un-recorded sites

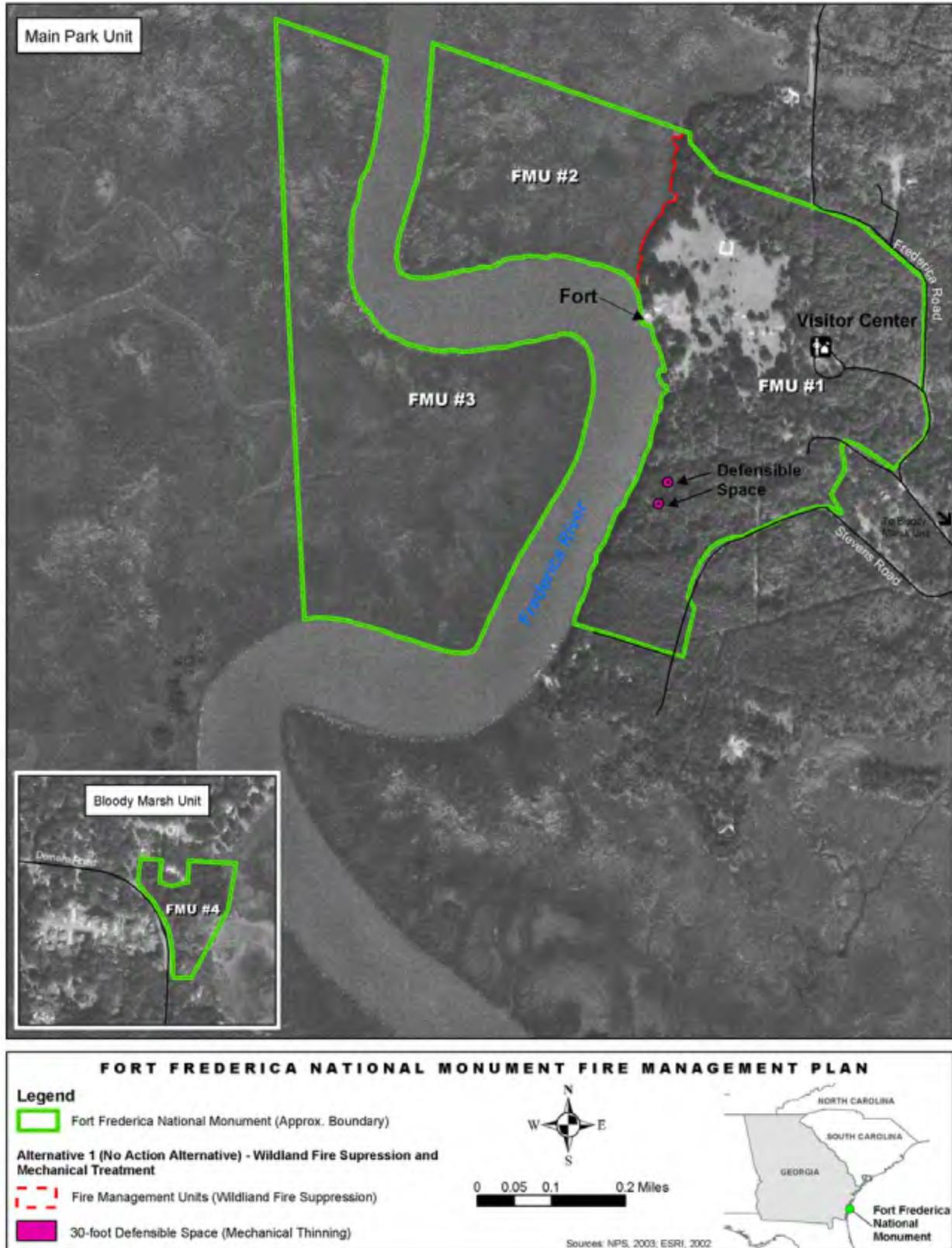


Figure 2-1 Fort Frederica National Monument– Alternative 1 (No Action Alternative)



Figure 2-2 Fort Frederica National Monument– Alternative 2 and 3 (Preferred Alternative)

Chapter 3 – Environmental Analysis

This chapter summarizes the existing environmental conditions and the probable environmental consequences (effects) of implementing the Action and No-Action alternatives. This chapter also provides the scientific and analytical basis for comparing the alternatives. The probable environmental effects are quantified where possible; where not possible, qualitative descriptions are provided. Descriptions of the Affected Environment for the various impact topics were taken from the park's 2001 General Management Plan (copies of this plan can be obtained from the park headquarters).

3.1 SOILS AND GEOLOGY

3.1.1 *Affected Environment*

Fort Frederica National Monument is located within the Atlantic Coast Flatwoods of Georgia. This province occurs along the seaward portion of Georgia, and is characterized by nearly level topography and poorly drained soils underlain by marine sands, loams, and/or clays. The lower-lying flat terraces do not have well-defined drainage systems, and runoff moves slowly into slow-moving streams and finally into the ocean. Elevation ranges from sea level to about 300 feet.

The primary soil series represented within the upland portion of the park are Cainhoy, Pelham, Pottsburg, and Rutledge; Bohicket and Capers occur in the marshland.

- Bohicket: Very poorly drained, very slowly permeable soils that formed in marine sediments in tidal marshes. These soils are flooded twice daily by seawater. Slopes are less than 2 percent.
- Cainhoy: Deep, excessively drained, rapidly permeable soils that formed in sandy marine sediments. Slopes range from 0 to 10 percent.
- Capers: Very poorly drained, very slowly permeable soils in tidal marshes that formed in silty and clayey marine and stream terraces. Slopes range from 0 to 2 percent.
- Pelham: Deep, poorly drained, moderately permeable soils that formed in unconsolidated Coastal Plain sediments. Located on nearly level broad flats, toe slopes, depressions and drainage-ways. Slopes range from 0 to 5 percent.
- Pottsburg: Deep, poorly drained, moderately permeable soils that formed in sandy marine deposits. Located on flats, in areas of flatwoods, on rises, and on knolls. Slopes range from 0 to 2 percent.
- Rutledge: Deep, very poorly drained, rapidly permeable soils that formed in marine or fluvial sediments. Located on flats, depressions, and floodplains. Slopes range from 0 to 2 percent.

3.1.2 *Environmental Consequences*

Soil impacts were qualitatively assessed using soil characteristics, literature reviews, and mitigation measures.

3.1.2.1 Alternative 1 (No Action)

Proposed activities with the potential to impact soils include building firelines during wildland fire suppression, and thinning.

Minor and localized soil compaction would occur from wildland fire suppression and thinning activities, and vehicle use would be restricted to existing roads. Fireline construction during wildland fire suppression would result in soil disturbance and could lead to increased erosion. To minimize potential soil impacts from suppression activities, ground disturbance within known natural resource locations would be avoided as much as possible. When fireline construction is necessary in proximity to these resource locations it will involve as little ground disturbance as possible and be located as far outside of resource boundaries as possible. In addition, natural barriers (e.g. trails, roads) would be used to the greatest extent possible. Following fire suppression activities, firelines would be re-contoured, water barred, and possibly seeded with native plant species.

Manual and mechanical thinning (e.g. chainsaws, bush hogs) would be utilized to maintain open areas and historic vistas, promote exotic vegetation species control, and create/maintain defensible space of at least 30 feet around all park buildings. While a few large diameter hazard trees may be cut, thinning efforts would focus primarily on small diameter woody shrubs and trees. Mechanical thinning efforts would also include mowing. This limited amount of manual and mechanical thinning (e.g. chainsaws, bush hog, and mowing) proposed by the park would result in only minor and localized soil compaction and soil erosion.

3.1.2.2 Alternative 2

Proposed activities with the potential to impact soils include building firelines during wildland fire suppression, and hazard fuels reduction activities.

General soil impacts resulting from the building of firelines during wildland fire suppression activities would be the same as described in the No Action Alternative. General soil impacts (e.g. erosion, compaction) from hazard fuels reduction activities on 1.6 acres of the park perimeter and on two small patches (.2 acres) of defensible space around the loading shed and black powder magazine could result in areas of localized soil disturbance, soil compaction, and rutting. These impacts would be increased with the use of wheeled or tracked vehicles to thin trees and to remove slash. These impacts, however, would be mitigated by restricting work based on ground moisture conditions to prevent rutting by equipment.

Hazard fuels accumulations would be mechanically (bush hogged/chainsawed) reduced to create and maintain a 30-foot radius of defensible space around a black powder magazine and a loading shed, both under construction at the time of this writing. Total area affected would be

approximately .2 acre. In all cases, fuels considered to be “hazards” would primarily be dead and down timber, ladder fuels, undergrowth and fallen limbs, briars, and brush/timber of less than 6 inches dbh (diameter at breast height). Remaining live trees would be limbed to approximately 12 feet from the base of tree. All down trees larger than 24 inches in diameter may remain in the fuel break, but must lie flush to the ground, with limbs cut and removed.

3.1.2.3 Alternative 3 (Preferred Alternative)

Proposed activities with the potential to impact soils include wildland fire suppression activities, creating hazard fuels breaks, and prescribed fire.

General soil impacts would be similar to those described under the No Action Alternative and Alternative 2.

Prescribed fire would release nutrients into the soil and the fertilization effects of ash would provide an important source of nutrients for vegetation within the treatment unit. In addition to increasing nitrification of the soils 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, mycorrhizae, and roots (Vogl, 1979; Wright and Bailey, 1980).

If a prescribed fire 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 repellent. 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.

Conclusion

All three alternatives would have very minor, localized, and short-term soil erosion impacts resulting from mechanical thinning and, in the case of Alternative 3, prescribed fire activities. However, prescribed fire activities, as detailed in Alternative 3, would release nutrients into the soil and the fertilization effects of ash would provide an important source of nutrients for vegetation in the area.

The implementation of any of the alternatives would not impair geologic and soil resources or values that are (1) necessary to fulfill specific purposes identified in the enabling legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, and (3) identified as a goal in the park’s general management plan or other NPS planning documents. Alternative 3 would be the most beneficial of the three alternatives to soil development and soil nitrification because of the prescribed burning.

3.2 WATER RESOURCES (INCLUDING FLOODPLAINS)

3.2.1 *Affected Environment*

Fort Frederica is situated on a bluff overlooking the Frederica River and vast salt marshes. The Frederica River is a tidal river that separates Saint Simons Island from the saltwater marshes to the west, the MacKay River (another tidal river), and ultimately the mainland at Brunswick, Georgia. At one time the river was a part of the Intracoastal Waterway and was dredged by the U.S. Army Corps of Engineers. This may have contributed to erosion of the riverbank at Fort Frederica. The Frederica River forms the western boundary of the historic town site, but the National Monument boundary continues into the marshes on the western side of the river. According to officials of the Georgia Department of Natural Resources Coastal Resources Division, water quality in the marshlands along the Frederica River is undocumented.

Tidal freshwater marshes form inland from salt marshes and mangrove swamps, but are still affected by ocean tides. Grasses and floating-leaved aquatic plants typically dominate these wetlands, which are found in bays, inlets, and along tidal rivers. The National Monument Boundary includes a total of 130 acres of marshes on the northwest edge of the historic town site and on the western side of the Frederica River across from the town site. In addition, there are approximately 5 acres of marsh at the Bloody Marsh unit.

3.2.2 *Environmental Consequences*

Water resource impacts were qualitatively assessed using presence/absence of surface water resources and floodplains, literature reviews, and mitigation measures.

3.2.2.1 Alternative 1 (No Action)

Proposed activities with the potential to impact water resources include building firelines during wildland fire suppression, and thinning; however, in light of the mitigation measures employed during fire management activities, there would be little, if any, direct impacts on surface water resources on the park. The potential for an increase in turbidity and sediment delivery in the Frederica River or the surrounding saltwater marshes as a result of soil erosion following suppression activities exists; however, as described under Section 3.1.2.1, the degree of soil erosion would be minor and localized.

Manual and mechanical thinning and suppression activities would not involve the filling or disconnection of the floodplain, and would not affect the functionality of the floodplain.

3.2.2.2 Alternative 2

Proposed activities with the potential to impact water resources include building firelines during wildland fire suppression, and thinning. General water resources impacts under Alternative 2 would be similar to those described under the No Action Alternative. Hazard fuels reduction would have no immediate impact on water resources in the park due to the locality of the hazard fuels reduction treatment areas, and mitigation measures aimed at minimizing impacts.

3.2.2.3 Alternative 3 (Preferred Alternative)

Proposed activities with the potential to impact water resources include building firelines during wildland fire suppression, thinning, prescribed fire use, and hazard fuels reduction. General water resources impacts with regards to building firelines and thinning would be the same as in the No Action Alternative.

The potential exists for an increase in turbidity and sediment delivery into the Frederica River as a result of soil erosion after prescribed fire use; however, as described under Section 3.1.2.2, the degree of soil erosion would be minor and localized, and thus any increase in turbidity and sedimentation would also be minor and short-term. When prescribed fires are conducted properly, nutrient loss and stream sedimentation are likely to be minor compared with those resulting from mechanical methods of site preparation (Stanturf et al., 2001).

General impacts to water resources and floodplains would be similar to those described under the No Action Alternative.

Conclusion

The general impacts to water quality among the three alternatives would be similar in nature and minor. The implementation of any of the alternatives would not impair water resources or values that are (1) necessary to fulfill specific purposes identified in the enabling legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, and (3) identified as a goal in the park's general management plan or other NPS planning documents.

3.3 VEGETATION

3.3.1 *Affected Environment*

Currently, most of the wooded area within the park is dominated by loblolly pine, although it is returning to mixed oak and hardwoods similar to its pre-Colonial condition. In addition to the dominant loblolly pine (*Pinus taeda*), vegetation plots within the main park unit in 1983 identified varying amounts of laurel oak (*Quercus laurifolia*), water oak (*Quercus nigra*), live oak (*Quercus virginiana*), southern bay (*Magnolia virginiana*), blackgum (*Nyssa sylvatica*), southern red cedar (*Juniperus silicola*), red mulberry (*Morus rubra*), hackberry (*Celtis laevigata*), sweetgum (*Liquidambar styraciflua*), pecan (*Carya illinoensis*), pond pine (*Pinus serotina*), redbay (*Persea borbonia*), bayberry (*Myrica cerifera*), sassafras (*Sassafras albidum*), palmetto (*Serona repens*), yaupon (*Ilex vomitoria*), and blueberry (*Vaccinium* spp.).

Invasive and exotic plant species identified by park staff that pose the most significant threat to the native plant communities of the park include Daubentonia, Ligustrum (privet), and Wisteria. Table 3-1 identifies the habitat requirements for each species.

Table 3-1 Common Invasive and Exotic Plant Species at the Fort Frederica National Monument

Common Name	Scientific Name	Habitat
Daubentonia	<i>Daubentonia punicea</i>	Weedy in disturbed areas, roadsides, ditches; landscape as ornamental, naturalized in some areas of the Coastal Plain (Russell, 2004).
Wisteria	Wisteria spp.	Prefers full sun exposure, but established vines will persist and reproduce in partial shade. Vines often climb surrounding vegetation and structures toward sunlight. Tolerates a variety of soil and moisture regimes but prefers loamy, deep, well-drained soils. Commonly found along forest edges, roadsides, and ditches (UDSA, 2002).
Privet	<i>Ligustrum</i> spp.	Can tolerate a wide range of habitats including disturbed areas, old fields, primary woodlands, and closed canopy forests (TNC, 2000).

3.3.2 *Environmental Consequences*

Vegetation impacts were qualitatively assessed using presence/absence of plant species, literature reviews, and quantitatively assessed by acres impacted.

3.3.2.1 Alternative 1 (No Action)

Proposed activities with the potential to affect vegetation within the park include building firelines during wildland fire suppression, and thinning. Thinning and any fire suppression activities that resulted in soil disturbance (firelines) would make those disturbed areas more susceptible to invasive and exotic plant infestations, such as privet. These impacts would be minor and short-term with proper mitigations aimed minimizing soil disturbance. In addition, disturbed areas may be seeded with native grasses and would be monitored to guard against such infestations. Thinning activities aimed at removing exotic vegetation would also help reduce the extent of existing invasive and exotic infestations in the park.

3.3.2.2 Alternative 2

Proposed activities with the potential to affect vegetation include building firelines during wildland fire suppression, thinning, and hazard fuels reduction.

Impacts from manual/mechanical thinning, wildland fire suppression, and hazard fuels reduction activities would be similar to those described under the No Action Alternative. However, under this alternative, hazard fuels reduction would impact almost an additional 2 acres throughout the park.

3.3.2.3 Alternative 3 (Preferred Alternative)

Proposed activities with the potential to affect vegetation include building firelines during wildland fire suppression, thinning, hazard fuels reduction, and prescribed fire use.

Wildland fire suppression, thinning, and hazard fuels reduction would be conducted in the same manner and have the same impacts as in Alternative 2. Prescribed fire activities would occur on approximately 76 acres of the park under this alternative. The introduction of prescribed fire and selective thinning of encroaching woody tree species and exotic invasive species would have several beneficial effects. First, prescribed fire would promote the establishment of fire-adapted plant species such as loblolly pine. Second, prescribed fire would release nutrients into the soil, and the fertilization effects of ash would provide an important source of nutrition for vegetation.

Under the proposed action, prescribed fire would be employed on approximately 76 acres within the park. The introduction of prescribed fire would have several beneficial effects. A prescribed burn regime would help control some invasive weeds, increase plant habitat and diversity, and release nutrients into the soil. The fertilization effects of ash would provide an important source of nutrition for vegetation, allowing germination and propagation of many dormant, fire-dependant grassland species by exposing mineral soil.

Prescribed fire could result in the mortality of some plant species. However, these losses would be minor because they would not jeopardize the viability of the populations on and adjacent to the park. If a prescribed fire 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 repellent, making the soils unsuitable for plant growth. To ensure prescribed fires would not burn out of prescription, 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.

While fire may help control some invasive and exotic plant species, many are disturbance-adapted and fire increases their vigor and encourages their spread. The species listed below can re-sprout vigorously from rhizomes or root crowns after fires or colonize burned areas through prolific seed production (USDA 2002).

Table 3-2 Effects of Fire on the Most Troublesome Invasive and Exotic Plants at Fort Frederica

Common Name	Fire Effects
Daubentonia	No data available on effects of fire on Daubentonia, however plants can resprout after above ground vegetation has been removed (TNC 2000).
Wisteria spp.	Wisteria will continue to resprout after above ground vegetation is removed, until roots stores are exhausted (USDA, 2002).
Privet	In experimental trials of prescribed burning, there were no significant differences in the abundance of privet in burned vs. unburned plots. Privet litter has a low flammability and fires did not carry well in these treatments. However it has been shown that privet in low densities can be top-killed by prescribed fire and can be eliminated over time (TNC, 2000a)

If any of these invasive exotics were found in the area where prescribed fire was to be conducted, the park would need to employ other treatments, such as additional manual/mechanical thinning or reseeding with a weed-free seed mix after the burn to ensure the growth of these invasive plants would not be promoted under a prescribed fire regime.

Conclusion

While all three alternatives would provide positive benefits to the vegetative communities found within the park, the Preferred Alternative would provide the most with its use of prescribed fire. With the removal of encroaching woody vegetation and reduction of noxious weed species through mechanical thinning and prescribed burns, positive benefits to native plant habitat and species diversity would be accrued, giving a competitive advantage to native plant species.

The implementation of any of the alternatives would not impair vegetation resources or values that are (1) necessary to fulfill specific purposes identified in the enabling legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, and (3) identified as a goal in the park’s general management plan or other NPS planning documents.

3.4 WILDLIFE

3.4.1 Affected Environment

The 1997 Resource Management Plan for Fort Frederica reports, “No inventory has been made of faunal resources in Fort Frederica, including those inhabiting or utilizing the marsh environment and the terrestrial fauna.” However, The Georgia coastal region provides habitat for an abundant variety of wildlife, including the common squirrels, birds, raccoons, opossum, lizards, and reptiles frequently observed at Fort Frederica. It has been documented that the Georgia coast provides habitat for over 300 species of birds. Some common migratory birds that could utilize the area include the painted bunting, grey-cheeked and Swainson’s thrush, and various species of warblers. The Southeast Region of the National Park Service is currently conducting several natural resource surveys at Fort Frederica, while U.S. Fish and Wildlife Service is presently compiling a list of migratory birds that use Fort Frederica.

Coordination with the U.S. Fish and Wildlife Service and the Georgia Department of Natural Resources revealed that the following federally- or state-listed threatened or endangered species could potentially occur within park boundaries:

- Bald eagle (*Haliaeetus leucocephalus*), federally-listed threatened, state-listed endangered
- Eastern indigo snake (*Dyrmarchon corais*), federally- and state-listed threatened
- Gopher tortoise (*Gopherus polyphemus*), state-listed threatened
- Peregrine falcon (*Falco peregrinus anatum*), state-listed endangered
- West Indian manatee (*Trichechus manatus*), federally- and state-listed endangered
- Wood stork (*Mycteria americana*), federally- and state-listed threatened

Of the above-listed species, the only one that has actually been documented within park boundaries is the West Indian manatee, observed on two occasions during the summer of 1990 in the Frederica River at the foot of the King's Magazine. No designated critical habitat exists at the park.

3.4.2 *Environmental Consequences*

Wildlife impacts were qualitatively assessed using presence/absence determinations, literature reviews, and mitigation measures

3.4.2.1 Alternative 1 (No Action)

Proposed activities with the potential to impact wildlife include building fireline during wildland fire suppression, and thinning.

All of the fire management activities could result in the short-term displacement of wildlife or individual mortality of wildlife species. The loss of individuals of a non-threatened or endangered species, however, would not jeopardize the viability of the populations on and adjacent to the park. There would be some loss of migratory bird habitat as a result of thinning woody shrubs and trees; however, the limited amount of thinning to be conducted would not adversely affect the viability of the nesting populations on the park. The removal of invasive plant species and the subsequent promotion of native plant species would likely benefit some passerine migratory birds with improved nesting and foraging habitat.

There would be no impacts to any of the state- or federally-listed threatened or endangered species that may occur in the park from fire management activities, in the event that any besides the West Indian manatee were found to inhabit the park. As stated in the National Park System's 2001 Management Policies, if any federally- or state-listed species were to be documented within the park boundaries, active management programs would be undertaken to inventory, monitor, restore, and maintain the listed species' habitats, control detrimental non-native species, control detrimental visitor access, and re-establish extirpated populations as necessary to maintain the species and habitats upon which they depend. The park would also manage designated critical habitat, essential habitat, and recovery areas to maintain and enhance their value for the recovery of threatened and endangered species. Measures taken to protect those species, or their required

habitat, would supersede any management activities outlined in the FMP in the event any of those management activities would negatively impact the listed species.

Aquatic species in the Frederica River would not be affected by fireline construction, since this activity would not result in significant amounts of soil erosion and sediment delivery to the Frederica River, which could impact aquatic habitats.

3.4.2.2 Alternative 2

General wildlife impacts under Alternative 2, which include building firelines during wildland fire suppression and mechanical thinning, would be the same as the No Action Alternative. General impacts concerning reducing hazard fuels and creating/maintaining hazard fuels breaks along the park perimeter would be similar to the No Action Alternative; however, impacts would be felt over an additional 1.6 acres of the park perimeter and two small patches (.2 acres) of defensible space.

3.4.2.3 Alternative 3 (Preferred Alternative)

Proposed activities with the potential to impact wildlife includes building fireline during wildland fire suppression, thinning, prescribed fire, and hazard fuels reduction. General impacts to wildlife during these activities would be minor and would include the short-term loss of some habitat and isolated mortality of individuals. Conversely, the use of prescribed fire would enhance the variety and diversity of native plant and wildlife habitats in the park. Nutrients released to plants through the fertilization effects of ash would also provide an important source of nutrition for wildlife in the area. In the aftermath of a fire, for a season or more, plant growth tends to be more nutritious than that of unburned areas, containing more protein and nutrients and less lignin and crude fiber (Hunter, 1990). Prescribed fire activities would not directly impact nesting migratory birds since the activities would occur in the early spring, prior to the breeding season (generally May 15 - August 15).

Conclusion

Fire management activities from all three alternatives would temporarily displace some wildlife species, have some minor impacts to migratory bird habitat from thinning of encroaching trees and shrubs, and increase the possibility of individual mortality of some species. These impacts would be increased under the Preferred Alternative as the park implements prescribed fire. However, the use of prescribed fire under this alternative would ultimately improve wildlife habitat on those acres being treated.

The implementation of any of the alternatives would not impair wildlife resources or values that are (1) necessary to fulfill specific purposes identified in the enabling legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, and (3) identified as a goal in the park's general management plan or other NPS planning documents.

3.5 AIR QUALITY

3.5.1 *Affected Environment*

Under the terms of the 1990 Clean Air Act amendments, the park is designated as a Class II air quality area. By definition, Class II areas of the country are set aside under the Clean Air Act, but identified for somewhat less stringent protection from air pollution damage than Class I areas. The primary means by which the protection and enhancement of air quality is accomplished is through implementation of National Ambient Air Quality Standards (NAAQS). These standards address six pollutants known to harm human health including ozone, carbon monoxide, particulate matter, sulfur dioxide, lead, and nitrogen oxides (USDA, 2000a). Principal sources of air pollutants in the park vicinity include emissions from Brunswick, and motor vehicle emissions.

3.5.2 *Environmental Consequences*

Air quality impacts were qualitatively assessed upon review of National Park Service best management practices to reduce air emissions, Georgia Forestry Commission prescribed fire permit specifications and requirements, and the extent of proposed prescribed fire activities under all the alternatives.

3.5.2.1 Alternative 1 (No Action)

There would be no air quality impacts under this Alternative.

3.5.2.2 Alternative 2

There would be no air quality impacts under this Alternative.

3.5.2.3 Alternative 3 (Preferred Alternative)

The use of prescribed fire has the potential to impact air quality. Smoke consists of dispersed airborne solids and liquid particles, called particulates, which could remain suspended in the atmosphere for a few days to several months. Particulates can reduce visibility and contribute to respiratory problems. Very small particulates can travel great distances and add to regional haze problems. Regional haze can sometimes result from multiple burn days and/or multiple owners burning within an airshed over too short a period of time to allow for dispersion.

For prescribed fires, there are three principle strategies to manage smoke and reduce air quality effects. They include:

1. Avoidance - This strategy relies on monitoring meteorological conditions when scheduling prescribed fires to prevent smoke from drifting into sensitive receptors, or suspending burning until favorable weather (wind) conditions;

2. Dilution – This strategy ensures proper smoke dispersion in smoke-sensitive areas by controlling the rate of smoke emissions or scheduling prescribed fires when weather systems are unstable, not under conditions when a stable high-pressure area is forming with an associated subsidence inversion. An inversion would trap smoke near the ground; and

3. Emission Reduction – This strategy utilizes techniques to minimize the smoke output per unit area treated. Smoke emission is affected by the number of acres burned at one time, pre-burn fuel loadings, fuel consumption, and the emission factor. Reducing the number of acres that are burned at one time would reduce the amount of emissions generated by that burn. Reducing the fuel beforehand, e.g. removing firewood reduces the amount of fuel available. Conducting prescribed fires when fuel moistures are high can reduce fuel consumption. Emission factors can be reduced by pile burning or by using certain firing techniques such as mass ignition.

There are several “sensitive receptors” (e.g. homes, businesses) near the park that may be susceptible to smoke impacts from a prescribed fire. If weather conditions changed unexpectedly during a prescribed fire, and there was a potential for violating air quality standards or for adverse smoke impacts on these sensitive receptors, the park would implement a contingency plan, including the option for immediate suppression. Considering the relatively small number of acres that would be affected by prescribed fire in any given year (76 acres), and considering that the major fuel types (grasses/forbs/litter) to be burned on the park do not generate large quantities of smoke, prescribed fires would not violate daily national or state emission standards and would cause very minor and short-term air quality impacts. The greatest threat to air quality would be smoke impacts on sensitive receptors; however, the park would only conduct prescribed fires under environmental conditions that maximized smoke dispersion.

Conclusion

The No Action Alternative and Alternative 2 would not have any impacts on air quality, while Alternative 3 would have only very minor and short-term impacts resulting from prescribed fires. Alternative 3 would also have very minor, if any, smoke impacts on sensitive receptors.

The implementation of any of the alternatives would not impair air quality resources or values that are (1) necessary to fulfill specific purposes identified in the enabling legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, and (3) identified as a goal in the park’s general management plan or other NPS planning documents.

3.6 VISITOR USE AND EXPERIENCE (INCLUDING PARK OPERATIONS)

3.6.1 Affected Environment

Visitors to Fort Frederica typically arrive in private automobiles or tour buses via the entrance drive on Frederica Road. The majority of visitors live within a 2 to 3 hour drive of the site with smaller percentages being of national and international origin. Approximately 15% of visitors could be described as local residents. On average, visitors spend about one hour at the Fort

Frederica site and about 15 minutes at the Bloody Marsh unit, located about 6 miles to the south near the Saint Simons Island airport. Virtually all visitors take advantage of the nonpersonal information and orientation services offered; while a small percentage (approximately 7%) take advantage of formal interpretive programs. With few exceptions, recreational activities are limited to those consistent with Fort Frederica's purpose. Fishing at "the fort" is a local tradition and is permitted. There is no developed hiking, bicycle, or equestrian trails. Picnicking facilities are not available. Total recreational visits to the park for 2002 was roughly 240,000 visitors.

3.6.2 *Environmental Consequences*

Recreation impacts were qualitatively assessed in light of the intensity and duration of fire management activities as they relate to visitor use and experience. Visual resource impacts in this environmental assessment were assessed in terms of scenic integrity, visual wholeness, and unity of the landscape.

3.6.2.1 Alternative 1 (No Action)

There would be some short-term reduction in scenic integrity and visitor use and experience during and immediately following any thinning or wildland fire suppression activities from the presence of engines and thinning or fire crews. Short-term reduction in scenic integrity, however, would be minor because 1) fire management activities would likely involve only short-term presence of vehicles and people, 2) stumps would be cut flush with the ground, and 3) the thinning treatments would involve only limited and selective removal of trees and shrubs.

Thinning treatments would not disrupt or prevent visitor use of the auto tour road within the park, and may result in short-term visitor off-road access restrictions to certain areas of the park where thinning treatments were being conducted.

In the event of a wildland fire within or adjacent to the park, park operations could be temporarily affected depending on the severity of the fire and situation at hand as visitors and non-essential park personnel were evacuated to off-site and safe locations.

3.6.2.2 Alternative 2

General impacts to visitor use and experience would be similar to those described under the No Action Alternative.

3.6.2.3 Alternative 3 (Preferred Alternative)

Under Alternative 2, visitor use and experience impacts would be similar to those described under the No Action Alternative and Alternative 2 with regards to wildland fire suppression and thinning. Impacts from prescribed fire activities would be short-term and minor and result in a reduction of the scenic integrity and visitor use and experience during and immediately following any prescribed fire treatments. Impacts to the scenic integrity would include the presence of engines and fire crews. Short-term reduction in scenic integrity, however, would be minor because 1) fire management activities would involve only short-term presence of vehicles and people, and 2) smoke accumulation would be short-term since prescribed fires would be

ignited under favorable conditions for smoke dispersion, and 3) the charred landscape would be quickly covered up by spring “green-up.”

Any prescribed fires would likely produce short-term smoke accumulations that impact local visual quality. Minimizing smoke emissions through best management practices would reduce any short-term impacts.

Hazard fuels reduction activities would result in the short-term reduction in scenic integrity from the presence of work crews and equipment within the park. These activities would also result in short-term visitor off-road access restrictions to certain areas of the park where hazard fuels reduction treatments were being conducted.

Conclusion

Negative impacts to the park, under all three alternatives, would be very minor and short-term during thinning activities (e.g. trail closures or limited access to certain areas, presence of work crews in the vista). The potential for short-term closure of certain areas of the park, especially during the times of the prescribed burns, are increased under Alternative 3, the Preferred Alternative.

3.7 HUMAN HEALTH AND SAFETY

3.7.1 Affected Environment

In the event of potentially hazardous wildland fires within the park, the park superintendent and chief ranger would coordinate public notification efforts within and outside the park. The extent of public notice would depend on the specific fire situation. In every case, ensuring visitor and park staff safety would take priority over other activities.

3.7.2 Environmental Consequences

Human health & safety impacts were qualitatively assessed through determination of activities, equipment and conditions that could result in injury, literature review of type and extent of injury caused by equipment and conditions, and in light of mitigation measures and best management practices.

3.7.2.1 Alternative 1 (No Action)

Factors most likely to adversely impact firefighter health and safety include activities associated with wildland fire suppression efforts (injuries from the use of firefighting equipment, smoke inhalation, and, in severe cases, injuries from wildland fires). Impacts to the public could include smoke inhalation, and in severe cases, injuries from wildland fires.

Fireline construction can pose safety threats to firefighters. While each of the crew is trained in the use of firefighting equipment, accidental injuries may occur from time to time. Strict

adherence to guidelines concerning firefighter accreditation, and equipment and procedure safety guidelines would minimize accidents.

Smoke inhalation can also pose a threat to human health & safety. Smoke from wildland fires is composed of hundreds of chemicals in gaseous, liquid, and solid forms. The chief inhalation hazard appears to be carbon monoxide (CO), aldehydes, respirable particulate matter with a median diameter of 2.5 micrometers (PM_{2.5}), and total suspended particulate (TSP). Adverse health effects of smoke exposure begin with acute, instantaneous eye and respiratory irritation and shortness of breath, but can develop into headaches, dizziness, and nausea lasting up to several hours. Based on a recent study of firefighter smoke exposure, most smoke exposures were not considered hazardous, but a small percentage routinely exceeded recommended exposure limits for carbon monoxide and respiratory irritants (USDA, 2000b).

3.7.2.2 Alternative 2

The general impacts to human health & safety under Alternative 2 would be similar to those described under the No Action Alternative.

3.7.2.3 Alternative 3 (Preferred Alternative)

The general impacts to human health & safety under Alternative 3 would be similar to those under the No Action Alternative and Alternative 2. In addition, use restrictions applied to areas of prescribed fire and thinning activities would minimize public human health & safety concerns resulting from smoke exposure and other injuries. When using prescribed fire, mitigation measures, such as construction of firelines, the presence of engines, and strict adherence to prescribed fire plans, would minimize the potential for an out-of-prescription fire or fire escape. Elements of the prescribed fire plan that relate to ensuring a safe burn include such measures as fuel moisture, wind speed, rate of fire spread, and estimated flame lengths. While the potential for a fire escape will always exist when conducting prescribed fires, that potential is extremely small. Recent statistics summarized by the National Interagency Fire Center report that approximately 1% of prescribed fires on federal lands required suppression activities of some kind. In most cases these prescribed fires jumped a control line and suppression tactics were successfully used to control them. Out of the 1% of prescribed fires that required suppression, 90% were controlled without incident. Statistically, this result leaves about 0.1% of prescribed fires that required major suppression actions (Stevens, 2000).

Conclusion

Under all three alternatives there is the potential for injury to workers from suppressing wildland fires and conducting mechanical thinning. Under Alternative 3, the potential for minor exposure to smoke by workers and the public during prescribed fire is slightly increased.

3.8 CULTURAL RESOURCES

Section 106 of the National Historic Preservation Act requires federal agencies to consider the effects of their proposals on historic properties, and to provide state historic preservation officers, tribal historic preservation officers, and, as necessary, the Advisory Council on Historic Preservation a reasonable opportunity to review and comment on these actions. The consultation process with the Georgia State Historic Preservation Office was initiated in 2003. Letters and comments from the Georgia State Historic Preservation Office can be found in Appendix A.

3.8.1 *Affected Environment*

Cultural resources at the park include 19 brick, tabby, and earthen remains of foundations and other structures that were part of the original settlement. All of these structures are individually listed on the National Register of Historic Places. Only five of the structures are above ground level; the remainders are archeologically exposed foundations. There are also very likely additional physical remnants of the settlement, which are still buried in the areas around the foundations and in other areas of the site. Earthworks that formed part of the town's defenses are still in evidence, though greatly reduced in size and softened in shape by time and weather. The moat is also still visible in spite of having been partially filled over the past 250 years.

According to the park's Resource Management Plan, "Overall, the town site and fort are in fair condition, owing to their exposure to the elements and visitor contact." Both the Resource Management Plan and the 1999 Management Analysis Report for the park discuss the need for preservation guidance in the form of a plan that details the appropriate techniques, tools, materials, and scheduling for preserving the park's cultural resources-ruins, foundations, earthworks, and monuments.

There have been at least 40 archeological investigations at the park since the 1940s. Many of the excavated sites have been left exposed as interpretive exhibits, with some stabilization accomplished to protect the features. Thousands of artifacts recovered through these excavations are housed in the park's collection and in storage at the NPS Southeast Archeological Center in Tallahassee, Florida. In addition, the Margaret Davis Cate archives collection, bequeathed to Fort Frederica in 1961, is on long-term renewal loan to the Georgia Historical Society in Savannah. The Cate collection includes 10,000 documents, books, manuscripts, photographs, maps, tapes, and recordings containing a vast amount of information on the people and events of the Fort Frederica settlement, as well as the history of St. Simons Island and other islands of coastal Georgia.

Thirty-one park structures are presently included on the List of Classified Structures (LCS). The park has an approved Land Protection Plan, which will be followed and updated as needed to maintain consistency with the park's cultural landscape preservation objectives. Park management attends and assertively participates in local and regional zoning and planning meetings and organizations, and keeps alert for other activities affecting the scenic approach to the park and the cultural landscape, including the marshlands.

3.8.2 *Environmental Consequences*

Cultural resource impacts were qualitatively assessed through a presence/absence determination of significant cultural resources and mitigation measures to be employed during wildland fire suppression, thinning, and prescribed fire activities.

3.8.2.1 Alternative 1 (No Action)

Proposed activities with the potential to affect known and unknown cultural resources include building firelines during wildland fire suppression, and thinning activities. The park will protect cultural resources by implementing the following fire management practices:

- Cultural resources will be protected from the adverse effects of unwanted fire as well as the adverse effects of fire management activities. During all suppression activities, the minimum impact suppression tactics policy will be incorporated to the greatest extent feasible and appropriate, employing methods least damaging to park resources for the given situation.
- The park will incorporate archeological/cultural/historic resources protection into fire management in a variety of ways. For example:
 - The park FMO will coordinate with the Southeast Archeological Center to ensure that FOFR has the most current data regarding archeological resources within its boundaries. S/he will provide recommendations on how to mitigate adverse effects to these resources during fire management activities, and will coordinate compliance with Section 106 of the National Historic Preservation Act, as appropriate.
 - Historic features, including foundations, structure remains, and above-ground burial vaults, will be protected from wildland fire via mowing of the grass around them.
 - During all suppression activities, the minimum impact suppression tactics policy will be incorporated to the greatest extent feasible and appropriate for the given situation. Tactics directly or indirectly facilitating the protection of archeological/cultural/historic resources include:
 - Keeping fire engines or slip-on units on existing roads.
 - Not using heavy equipment (e.g. bulldozers, plows) for constructing fireline.
 - Not using fireline explosives.
 - Using existing natural fuel breaks and human-made barriers, wet line, or cold trailing the fire edge in lieu of fireline construction whenever possible.
 - Keeping fireline width as narrow as possible when it must be constructed.

- Avoiding ground disturbance within known archeological/cultural/historic resource locations. When fireline construction is necessary in proximity to these resource locations it will involve as little ground disturbance as possible and be located as far outside of resource boundaries as possible.
- Using soaker hose, sprinklers or foggers in mop-up; avoiding boring and hydraulic action.

The objective of maintaining the historic appearance of the Fort and protecting identified cultural resources and cultural landscapes will be facilitated by the selective thinning of woody shrubs and trees encroaching upon the historic vistas, open fields, and earthworks. The cultural resources of the park would not be significantly and/or adversely impacted by thinning treatments.

3.8.2.2 Alternative 2

General impacts to cultural resource sites under Alternative 2 would be similar to those described under the No Action Alternative.

3.8.2.3 Alternative 3 (Preferred Alternative)

Impacts to cultural resource sites from these activities are similar to those described under the Alternative 2. As with the other alternatives, there would be the potential for fire management activities to impact unrecorded cultural resource sites.

Prescribed fire use would have negligible impacts on the cultural resources of the park. When using prescribed fire, mitigation measures, such as the avoidance of structures, mowed wetted firelines around the perimeter of the proposed prescribed fire, the presence of engines, and strict adherence to prescribed fire plans, would minimize the potential for an out-of-prescription burn or escape.

Consultation with the Georgia Department on Natural Resources, Historic Preservation Division, on March 5, 2004, determined that no historic properties or archaeological resources that are listed in or eligible for listing in the National Register of Historic Places would be affected by any of the any of the proposed actions under this alternative.

Conclusion

The cultural resources of the park would be benefited equally under all three alternatives. Reducing hazard fuels within the park would protect cultural resources with the removal of hazard fuels.

The implementation of any of the alternatives would not impair cultural resources or values that are (1) necessary to fulfill specific purposes identified in the enabling legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, and (3) identified as a goal in the park's general management plan or other NPS planning documents.

3.9 CUMULATIVE IMPACTS

The cumulative impacts analysis for the Fire Management Plan environmental assessment considers the past, present, and reasonably foreseeable future actions on land uses that could add to (intensify) or offset (compensate for) the effects on the resources and that may be affected by the fire Management Plan alternatives. Cumulative impacts vary by resource and the geographic areas considered here are generally the park and areas adjacent to the park. In some instances, activities may result in both negative and positive impacts when considering the short and long-terms. As a result, some resource categories in Table 3-5 show both positive and negative impacts resulting from a particular activity. The information provided in Table 3-3 is the basis for the cumulative impacts described in Table 3-4.

Table 3-3 Affected Impact Topics and Activities/Land Uses
Contributing to Fire Management Plan Cumulative Impacts

	Soils	Water Resources	Vegetation	Wildlife	Air Quality	Visitor Use & Experience	Human Health & Safety	Cultural Resources
Past, current, and future archeological surveys within the park	-					+		+
Past, current, and future land acquisition in the park's authorized boundary	+	+	+	+		+	+	+
Future construction of wooden pre-fabricated building in the maintenance area that would serve as a laundry facility		-						
Future removal of large trees causing damage to historic structures						-		+
Future construction of a small interpretive hut in the visitor center vicinity that would show the sort of temporary quarters colonists lived in prior to building their permanent homes.						+		+
Future construction of second causeway to Saint Simon Island		-	-	-	-	+/-	+	
Past, current, and future commercial and residential development near the park	-	-	-	-	-	-		-

DIRECT/INDIRECT EFFECTS KEY: (+) Positive/beneficial; (-) Negative/detrimental; (Blank) Neutral/no effect

Table 3-4 Cumulative Impacts

Resource	Impacts from Past and Present Activities/Land Uses	Impacts from Future Activities/Land Uses	Impacts from Proposed Actions (No Action, Alternatives 2 and 3)	Cumulative Impacts from Proposed Actions
Soils	Adverse soil impacts (soil erosion or loss) from past and current residential and commercial development; beneficial soil impact as ecological function is restored on lands acquired for inclusion to the park; minor soil disturbance resulting from past archeological surveys	Beneficial soil impact as ecological function is restored on lands acquired for inclusion to the park	Prescribed fire, hazard fuels reduction and thinning activities would have localized, short-term and minor adverse effects on soils (soil disturbance and erosion), but prescribed fire would provide beneficial effects as well over the short and long-terms (soil development and soil nutrification)	Soils inside of the park would improve over time with soil development and nutrification from prescribed fires; Fire Management Plan would not result in significant cumulative impacts; The Preferred Alternative would contribute the most beneficial soil cumulative impacts, while the No Action Alternative would contribute the least
Water Resources	Past and current residential and commercial development adjacent to the park would adversely impact water resources (turbidity, sediment delivery, pollution, water consumption); beneficial impact to water resources is restored on lands acquired for inclusion to the park	Increased development in areas adjacent to the park would directly and indirectly impact water resources (turbidity, sediment delivery, pollution, water consumption); future construction of laundry facility would have impacts to the total water consumption of the park; future construction of causeway would increase impermeable surfaces and increase runoff into Frederica River which would adversely impact water resources	Prescribed fires and thinning activities would have no direct impacts on water resources, and minor indirect impacts (turbidity and sediment delivery from soil erosion)	Only minor, short-term indirect impacts to water resources would result from the proposed actions; Fire Management Plan would not result in significant cumulative effects on water resources; The Preferred Alternative could potentially contribute the most to water resource cumulative impacts, while the No Action Alternative would contribute the least
Vegetation	Past and current land acquisition preserves vegetation communities; past and current development adjacent to the park alters vegetation communities	Future land acquisition preserves vegetation communities; future development adjacent to the park and construction of causeway would adversely impact vegetation communities	Prescribed fire and thinning activities would promote native fire-adapted species; thinning of exotic species would be beneficial for native species; however, soil disturbance from these activities could result in increased occurrence of invasive exotic species	Invasive exotic plant species would continue to decline; Fire Management Plan would not result in significant cumulative impacts; the Preferred Alternative would contribute the most beneficial cumulative impacts to the vegetative resources of the park with its prescribed fire use, while the No Action Alternative would contribute the least
Wildlife	Past and current land acquisition preserves wildlife habitat and promote diversity; past and current development adjacent to the park reduces wildlife habitat and fragments wildlife corridors and edge habitat	Future development adjacent to the park would destroy and fragment wildlife habitat; future construction of causeway would adversely impact some habitat near the park; future land acquisition would preserve wildlife habitat and promote diversity	Prescribed fire and thinning activities would result in minor, short-term disturbance and displacement with minimal species loss; improved habitat and increased wildlife diversity with prescribed fire use; no impacts to any federally-listed threatened or endangered species	Wildlife habitat and diversity increases with prescribed fire use; Fire Management Plan would not result in significant cumulative impacts; The Preferred Alternative would contribute the most beneficial cumulative impacts to the wildlife of the park, while the No Action Alternative would contribute the least

Table 3-4 Cumulative Impacts

Resource	Impacts from Past and Present Activities/Land Uses	Impacts from Future Activities/Land Uses	Impacts from Proposed Actions (No Action, Alternatives 2 and 3)	Cumulative Impacts from Proposed Actions
Air Quality	Commercial and industrial practices emit pollutants and particulate matter; automobiles on and off the park contribute to some short-term deterioration in air quality and visibility	Similar effects as described in past and present activities/land uses; future construction of causeway would bring more cars into the park, adversely impacting air quality	Prescribed fire emissions would result in very minor, short-term air quality and visibility impacts	Class II air quality standards would not be violated; Fire Management Plan would not result in significant cumulative impacts; The Preferred Alternative would contribute the most negative air quality cumulative impacts, while the No Action and Alternative 2 would not cause any air quality impacts
Visitor Use and Experience (including Park Operations)	Past and current land acquisition provides additional recreational opportunities for the visitor; past and current development adjacent to the park degrades cultural landscape; past and current archeological surveys of the park provide educational benefits to the public	Future land acquisition enhances visitor use and experience; future residential and commercial development and construction of highways near the park degrade the cultural landscape and degrade visitor use and experience; future construction of causeway would bring more tourists to park; future archeological surveys of the park provide educational benefits to the public; future construction of interpretive hut would benefit visitors; removal of trees would protect historical structures from root damage, however, many of the visitors to the park would miss the large trees	Prescribed fire and thinning activities would result in minor and short-term visitor use and experience impacts; preservation of cultural landscapes in the park would enhance visitor use and experience	Long-term enhancement of recreation resources and opportunities offsets short-term recreation inconveniences from fire management activities; Fire Management Plan would not result in significant cumulative impacts; the Preferred Alternative would contribute the most positive and negative cumulative impacts to visitor use and experience, while the No Action Alternative would contribute the least
Human Health & Safety	Past and current development improves area's infrastructure improving human health and safety in areas outside the park boundaries.	Similar effects as described in past and present activities/land uses; construction of causeway to Saint Simon Island would improve traffic flow, increasing safety of drivers	Wildland fire suppression, prescribed fire and thinning activities may result in very minor impacts (cuts and bruises); hazard fuels reduction would reduce the threat of wildland fires both in terms of severity and spreading outside the park's boundaries	Fire Management activities would improve human health and safety in the event of wildland fire; Fire Management Plan would not result in significant cumulative impacts; the Preferred Alternative would contribute the most to human health and safety cumulative impacts by reducing the most hazard fuels, while the No Action Alternative would contribute the least
Cultural Resources	Past and current land acquisition preserves the cultural and historical landscape of the park; residential and commercial development degrades cultural landscapes of the park; past and current archeological surveys of the park provide educational benefits and increase historical knowledge of the park	Similar effects as described in past and present activities/land uses; future construction of interpretive hut would add to the cultural knowledge of the monument; removal of trees with the potential to damage cultural structures protects cultural resources of the park	Prescribed fire, hazard fuels reduction, and thinning activities preserve the cultural landscape of the park and help stabilize earthworks, and lessen the chance of a catastrophic wildland fire occurring in the park	Cultural and component landscapes continue to be preserved and enhanced; Fire Management Plan would not result in significant cumulative impacts; the Preferred Alternative would contribute the most to beneficial cumulative impacts to the cultural resources of the park, while the No Action Alternative would contribute the least

Consultation and Coordination

List of Preparers

Joel Gorder, Project Manager, Mangi Environmental Group
Rebecca Whitney, Geographic Information Systems (GIS) Analyst, Mangi Environmental Group

Persons, Organizations, and Agencies Consulted

Sandra Tucker, U.S. Fish and Wildlife Service
Serena Bellew, Georgia State Historic Preservation Office
Jami Hammond, Southeast Regional Office, National Park Service
Robin Toole, Southeast Regional Office, National Park Service
Mike Tennent, Superintendent
Kim Coons, Chief Ranger

Persons, Organizations, and Agencies Who Received this Environmental Assessment

Christ Church
Linda Allen
Five Properties Immediately Adjacent to Fort Frederica
Lt. Jerome Johnson – Fire Inspector/Fire Investigator
Sandra Tucker, U.S. Fish and Wildlife Service
Serena Bellew, Georgia State Historic Preservation Office

Scoping

Details of the scoping process and the issues that arose from it are described in Chapter 1, Section 1.5 – *Scoping Issues and Impact Topics*.

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APPENDIX A

CONSULTATIONS WITH U.S. FISH AND WILDLIFE SERVICE, , AND THE GEORGIA STATE HISTORIC PRESERVATION OFFICE



United States Department of the Interior

Fish and Wildlife Service
247 South Milledge Avenue
Athens, Georgia 30605

West Georgia Sub Office
P.O. Box 52560
Ft. Benning, Georgia 31995-2560

Coastal Sub Office
4270 Norwich Street
Brunswick, Georgia 31520

MAR 15 2004

Ms. Robin Toole
National Park Service
Southeast Regional Office
Atlanta Federal Center, 1924 Building
100 Alabama Street, S.W.
Atlanta, Georgia 30303

Re: FWS Log #04-0201

Dear Ms. Toole:

Thank you for your memo and attachments dated February 10, 2004 concerning the proposed draft Fire Management Plan for Fort Frederica National Monument on St. Simons Island, in Glynn County, Georgia. The U.S. Fish and Wildlife Service (Service) has reviewed the information you provided and submits the following comments under provisions of the Endangered Species Act of 1973 (Act) as amended (16 U.S.C. 1531 et seq.).

The draft Fire Management Plan proposes two fire management related actions over the next five years - a prescribe burn of a 76 acre unit and a mechanical hazard fuel reduction along 2 sections of the park perimeter for a total of about 2,055 linear feet and 1.6 acres. The 76 acres unit will be burned during late winter through early spring of one year. The mechanical hazard fuel reduction consists of mowing or chainsawing a 12 foot wide corridor along the park's perimeter. The only federally listed threatened or endangered species that has been documented within Fort Frederica National Monument's boundaries is the West Indian manatee. Therefore according to the information you provided, we believe this project should not have an adverse impact on Federally listed endangered or threatened species.

Thank you for your interest in the protection of endangered and threatened species. If you have any questions, please call staff biologist Robert Brooks of our Brunswick office at (912) 265-9336, extension 25.

Sincerely,

Sandra S. Tucker
Field Supervisor

for

