
**GUILFORD COURTHOUSE
NATIONAL MILITARY PARK
FIRE MANAGEMENT PLAN
(GREENSBORO, NORTH CAROLINA)**



**ENVIRONMENTAL ASSESSMENT
MAY 2004**

Guilford Courthouse National Military Park

Fire Management Plan – Environmental Assessment

National Park Service
U.S. Department of the Interior

Guilford Courthouse National Military Park
2332 New Garden Road
Greensboro, NC 27410-2355

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United States Department of the Interior

NATIONAL PARK SERVICE
Guilford Courthouse National Military Park
2332 New Garden Road
Greensboro, North Carolina 27410-2355

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2332 New Garden Road
Greensboro, NC 27410-2355

Dear Interested Party,

Enclosed is a copy of the **Guilford Courthouse National Military Park 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 2 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 control exotic vegetation species. 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 Guilford Courthouse National Military Park Fire Management Plan can be obtained from:

Charles Cranfield, Superintendent
Guilford Courthouse National Military Park
2332 New Garden Road
Greensboro, NC 27410-2355

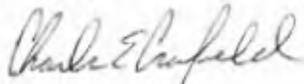
Written comments will be accepted until June 9, 2004, 30 days after the publication of the environmental assessment Notice of Availability in the News and Record, which will be on or about May 9, 2004. Please include the following information when submitting comments:

1. Name, address, and (if possible) telephone number;
2. Title of the document on which the comments are being submitted; and,
3. 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 (Charles_cranfield@nps.gov), fax: (336) 282-2296, phone:(336) 288-1776, or mail to Charles Cranfield, Superintendent, Guilford Courthouse National Military Park 2332 New Garden Road, Greensboro, NC 27410-2355.

Sincerely,



Charles Cranfield
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 Guilford Courthouse National Military Park 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 Guilford Courthouse National Military Park is faced with a decision to develop the park's Fire Management Plan as described below. This decision would be made within the overall management framework already established in the Guilford Courthouse National Military Park 1997 General Management Plan and is 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 1997 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."

Congress established the Guilford Courthouse National Military Park (39 Stat. 996) on March 2, 1917, to "...preserve for historical and professional military study one of the most memorable battles of the Revolutionary War..." Originally administered by the War Department, the park was transferred to National Park Service administration in 1933.

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 Guilford Courthouse National Military Park 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. (USDA, 2002a)" 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.

Early accounts and archeological evidence indicates that early Native Americans also utilized fire to modify ecosystems (USDA, 2000b), with profound cumulative effects on the landscape. At the time of European contact, many eastern deciduous forests were open and park-like, with little undergrowth (2000, Day 1953, Olson 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."

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 hazardous fuel accumulations. There is a need to preserve native plant communities, and restore and protect the historic landscape while at the same time protect visitors, facilities, and resources on and adjacent to the park.

1.2.1 Human Health & Safety

Guilford Courthouse National Military Park’s traditionally rural setting has undergone noticeable changes in the past two decades. Greensboro’s 1984 annexation of the area surrounding the park led to rapid residential and commercial development, which at present almost envelops the park with individual and multi-family housing units and businesses. A key component in meeting the underlying need of human health and safety with fire management 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. Reducing the fire hazard 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). 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 structures and/or communities. In addition, a wildland urban interface that is properly thinned would be less likely to sustain a crown fire that enters or originates within it.

1.3 BACKGROUND

Guilford Courthouse National Military Park is located in Guilford County, North Carolina. The main park unit consists of approximately 230 acres and is nearly contained within the city limits of Greensboro, which has a population of almost 224,000. The battle fought at Guilford Courthouse was the largest and most hotly contested action of the Revolutionary War's Southern Campaign. It is considered the high-water mark of that campaign in that it changed the course of the war. The serious loss of British manpower suffered at Guilford Courthouse foreshadowed Lord Cornwallis's final defeat at Yorktown seven months later.

There are no indications in the historic record as to the extent of frequency of fire activity (either natural or prescribed) in the specific park vicinity. Since Guilford Courthouse National Military Park entered National Park Service administration in 1933, all wildland fires have been suppressed.

On average, the occurrence of wildland fires at the park has been low, since 1980 there has been only one known wildland fires.

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 wildland fires are classified as either wildfires 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. Human-caused wildfires are unplanned events and may or may not be used to achieve resource management objectives.

Wildfires are any non-structure 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) or human-ignited 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

The overall objectives of the Guilford Courthouse National Military Park 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 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.
- Preserve the historic (1781) landscape.
- Control exotic vegetation species, which compete with native vegetation and alter 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.

The park's 1997 General Management Plan objectives include:

- Manage the landscape to reflect the setting at each of the three lines of battle and site of the courthouse; and to protect and preserve commemorative elements including monuments, graves, and historic features.
- Promote and preserve a historical and tranquil environment conducive to the education of the public/visitor and their appreciation of the battle of Guilford Courthouse.

- Provide for a system that effectively directs visitors to the park, promotes the movement of visitors within/through the park in a manner that is compatible with park objectives, and provides all visitors the opportunity to experience the historical points of interest of Guilford Courthouse National Military Park.
- Foster cooperative relationships with other agencies, organizations, and park neighbors to promote expansion of outreach, maintain compatibility with area park system and maintain status as an effective member of the neighborhood.

Resource management objectives in relation to the fire management program include the following:

- Thin or remove hazardous trees as identified.
- Eradicate exotic plants.
- Preserve and maintain monuments.

1.5 SCOPING ISSUES AND IMPACT TOPICS

On November 10, 2003, the park placed scoping notices at 12 public locations around Greensboro and mailed scoping letters to a number of individuals and organizations describing the proposed actions of the park's Fire Management Plan and inviting the public to the park to discuss these actions with park staff. The scoping period lasted from November 10 to December 01, 2003, no comments were received. As a result, park personnel developed all alternatives and impacts to be considered in this EA.

1.5.1 *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. In addition, fire management activities such as hazardous fuels reduction and the digging of firelines can also 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 and fire suppression efforts can adversely impact water quality (sedimentation, turbidity, chemicals); therefore, impacts to water resources are analyzed in this EA.

Vegetation: NatureServe recently completed a vascular plant inventory of the park, adding 255 new species to the list of vascular flora heretofore known to occur at Guilford Courthouse National Military Park. There are presently 346 recorded vascular plant species for the park, and

it is estimated that between 76 and 95% of the vascular flora in the park are presently documented, with 11 distinct vegetative groups. Thinning 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 fire management activities such as the mechanical thinning of hazardous fuels. 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. While there are no documented Threatened or Endangered species located in the park, coordination with the USFWS and the North Carolina Natural Heritage Program revealed that two federally- and state-listed species could potentially occur here, therefore, impacts to T&E species will be 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 temporary 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 provides the framework for Federal review and protection of cultural resources, and ensures that they are considered during Federal project planning and execution. Guilford Courthouse National Military Park in its entirety is listed in the National Register of Historic Places. As per the draft Guilford Courthouse National Military Park Cultural Landscape Report, there is one cultural landscape (the Guilford Courthouse battlefield), and two component landscapes (the Greene Monument and the Superintendent's Residence-Maintenance Complex) present at the park. In addition thirty-two park structures are presently included on the List of Classified Structures (LCS). While the use of fire management activities within the park are consistent with the GMP

with regards to maintaining and protecting the Park's historic landscape, 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.

1.5.2 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, along with the rationale for considering them, but dropping them from further analysis.

Noise: Noise is defined as unwanted sound. Fuels reduction and fire suppression efforts can all involve the use of noise-generating mechanical tools and devices with engines, such as chain saws and trucks. Chain saws, 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 temporary closure of nearby roads during fire suppression activities or from heavy smoke emanating from wildland fires. Over the long term, such closures would not significantly impinge local traffic since they would be both very infrequent, (on the magnitude of 1-2 hours). 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 objectives of the Guilford Courthouse National Military Park Fire Management Plan 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. Fire management activities, however, would not prevent these lands from being farmed under special use permit. Therefore, this impact topic is not evaluated further in this EA.

Wilderness: According to National Park Service Management Policies (DOI, 2001b), 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 Guilford Courthouse National Military Park 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>
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>
Threatened and Endangered Species and their Habitats	Dismissed	Endangered Species Act; 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>

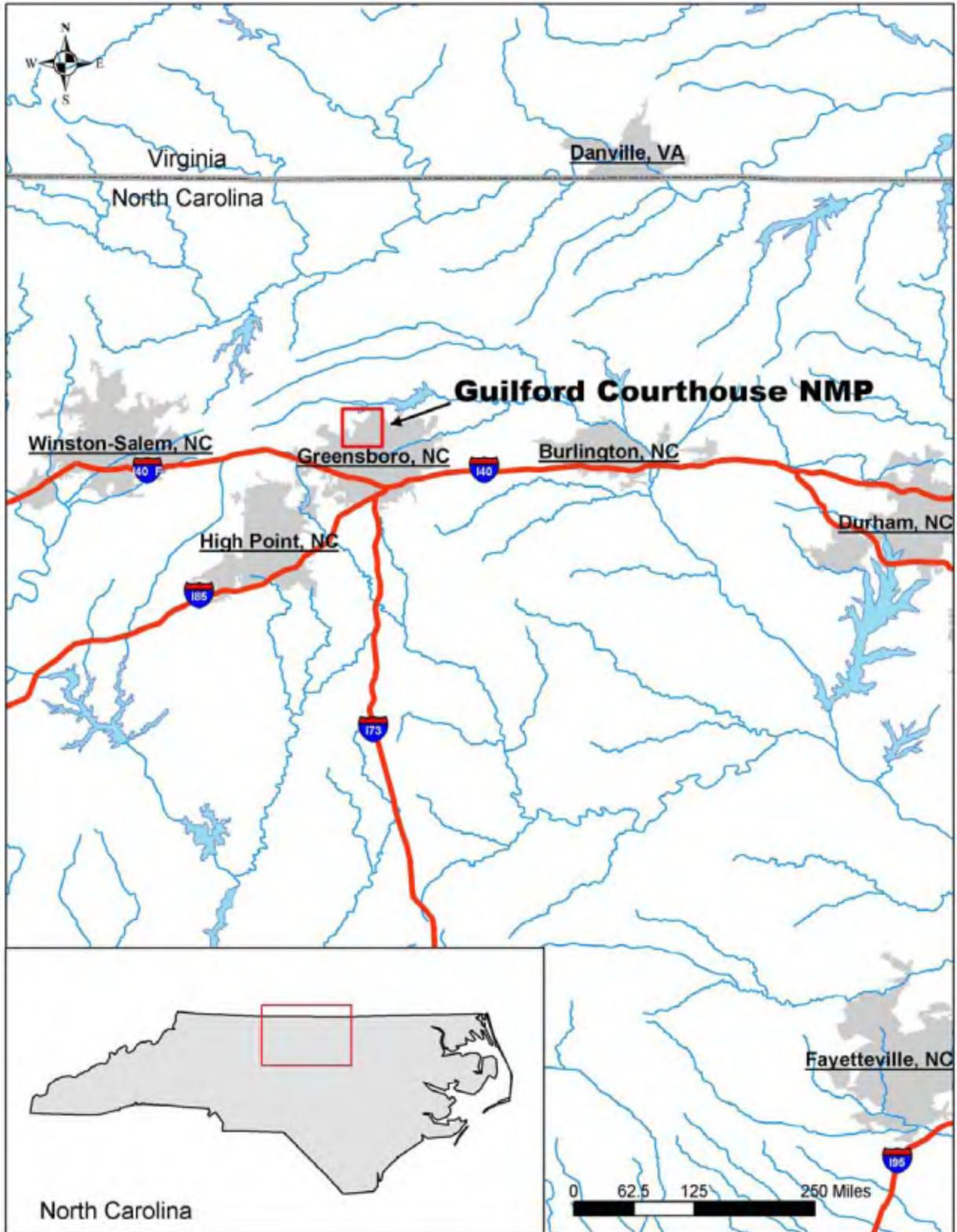


Figure 1-1 Guilford Courthouse National Military Park Vicinity

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 either human or 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 wildfire. 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 because the current authorized boundary of the park (229 acres) is too small to ensure fire containment within park boundaries, staffing limitations, and the fact that the park is virtually enveloped within the city limits of Greensboro, North Carolina. 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 in the Fire Management Plan.

2.2 ALTERNATIVES CONSIDERED AND ANALYZED IN THIS EA

2.2.1 *Fire Management Units*

Due to its small size (approximately 229 acres) and uniformity, Guilford Courthouse National Military Park will be managed as a single fire management unit (FMU) for the following three alternatives. A 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)

2.2.2 *Alternative 1 (No Action Alternative) - Fire Management Plan to Include Wildland Fire Suppression, Manual/Mechanical Thinning Treatments, and Maintenance of Existing Hazard Fuels Break.*

Under this alternative, the Fire Management Plan would continue with its existing fire management policies, which would include the suppression of all wildland fires, allow for

manual/mechanical treatments and the maintenance of established hazard fuels breaks. Management objectives would include:

- Conducting initial wildland fire attack within 5-10 minutes of the time report is received.
- Controlling 95% or higher of all wildland fires during initial attack.
- Mechanically maintaining existing 30-foot wide hazard fuels breaks along the majority of the park perimeter and a portion of the park tour road (15 feet wide along either side), and existing defensible space of at least 50 feet around all park buildings.
- Controlling exotic vegetation species via non-fire applications, which compete with native vegetation and alter the historic landscape.

Under this alternative, all wildland fires in the park, human-caused fires and naturally ignited fires (e.g. lightning), would be declared wildfires and suppressed in a manner that minimizes the negative environmental impacts of suppression activities. Examples of suppression tactics that may cause environmental harm include building of firelines, the use of chemical fire retardant near waterbodies, and the excessive cutting of trees. All wildfire 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 involve limited, selective thinning of woody vegetation and exotic vegetation encroaching upon open fields, and historic vistas, as well as any hazard trees. While a few large diameter trees may be cut, thinning efforts would focus primarily on small diameter woody shrubs and trees of less than 4 inches dbh, and invasive exotic vegetation. Mechanical thinning efforts would also include mowing.

Maintenance would continue on the existing 30-foot wide hazard fuels breaks along the majority of the park perimeter and a portion of the park tour road (15 feet wide along either side), and existing defensible space of at least 50 feet around all park buildings.

2.2.3 Alternative 2 (Preferred Alternative) - *Fire Management Plan to Include Wildland Fire Suppression, Manual/Mechanical Thinning Treatments, and Hazardous Fuels Reductions*

Under this alternative, the Fire Management Plan would include the suppression of all wildland fires, allow for manual/mechanical treatments and the maintenance of established hazard fuels breaks, and increased hazardous fuels reduction.

Under this alternative, all wildland fires in the park, human-caused fires and naturally ignited fires (e.g. lightning), would be declared wildfires and suppressed in a manner that minimizes the negative environmental impacts of suppression activities. All wildfire suppression activities would adhere to Minimum Impact Suppression Tactics (MIST) guidelines as outlined in Section 2.3 *Mitigation Measures and Monitoring*.

Manual/mechanical thinning would be conducted in the same manner as in the “No Action” Alternative, and maintenance would continue on the existing 30-foot wide hazard fuels breaks

along the majority of the park perimeter, the portion of the park tour road (15 feet wide along either side), and existing defensible space of at least 50 feet around all park buildings. Management objectives under this alternative however would be expanded from the “No Action” Alternative to include:

- A reduction in the amount of hazardous fuels within three separate areas, totaling approximately 59 acres. Ultimately shifting these acres from their current condition class 2, toward condition class 1 (see text box for definitions).
- Mechanically create and maintain a 15-foot wide hazard fuels break along either side of the park entrance road and that portion of the tour road where a fuel break does not presently exist.

Hazard fuels reduction at the park would be conducted in association with the Wildland Urban Interface Initiative. Hazard fuels accumulations would be mechanically reduced and maintained within three areas, totaling approximately 59 acres (Figure 2-1). These three units were delineated because they were the areas with very thick undergrowth in need of thinning. A 15-foot wide hazard fuels break would also be mechanically created and maintained along either side of the park entrance road and that portion of the tour road where a fuel break does not presently exist, totaling approximately 9,680 linear feet (1.83 miles), and 6.75 acres.

Hazard fuels reduction and hazard fuels break creation will entail selectively thinning (e.g. chainsawing) and removing hazard fuels. Fuels considered to be “hazards” would primarily be dead and down timber, ladder fuels, undergrowth and fallen limbs, briars, exotic vegetation, and brush/timber of less than two 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. Once the initial fuel reduction has been accomplished, maintenance would involve broadcasting any subsequent debris evenly throughout the area, see figure 2-2 for areas to be treated.

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 (Schmidt, et al, 2000).

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 (Schmidt, et al, 2000).

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).

Table 2-1 Hazard Fuels Break Creation and Hazard Fuels Reduction Schedule

Treatment Unit Name	Area Treated	Initial Treatment	Maintenance	Fuel Description
Hazard fuels break, park entrance/tour road	9,680 linear feet Totaling 6.75 acres	March-June 2005	Annually as Needed	Hardwood & pine timber Condition class 2
Area A	23.5 acres	March-June 2005	Annually as Needed	Hardwood & pine timber Condition class 2
Area B	13.5 acres	March-June 2005	Annually as Needed	Hardwood & pine timber Condition class 2
Area C	22 acres	March-June 2005	Annually as Needed	Hardwood & pine timber Condition class 2

2.2.4 Alternative 3 – *Fire Management Plan to Include Wildland Fire Suppression, Manual/Mechanical Thinning Treatments, Hazard Fuels Reduction, and Prescribed Fire Use*

Under this alternative, wildland fire suppression along with the maintenance of existing hazardous fuels breaks and the creation of a 9,680 foot hazardous fuels break would be conducted in the same manner as in the “Preferred” Alternative. However, in lieu of using mechanical means to reduce hazardous fuels in Treatment Units A, B, and C, prescribed fire would be utilized in these areas. Prescribed fire would be used to expand the park’s management objectives to promote ecosystem sustainability and to restore a more natural fire regime with the use of prescribed fire on all three Treatment Units totaling 59 acres (Figure 2-2). Prescribed fire was chosen for these areas because the steep terrain makes clearing these areas of unwanted vegetation through manual/mechanical means difficult. The treatment units for Alternative 3 are illustrated in Figure 2-2 and described in Table 2-1. After the initial prescribed burn, fire return intervals would be every three to five years, and occur between December and March. Under this alternative, all four fire units would either be burned simultaneously or burned separately during the course of the initial 2004/2005 burning season (December 2004 to March 2005). Currently, all three treatment units are considered to be in Condition Class 2, as defined in the USDA Forest Service General Technical Report entitled *Development of Coarse-Scale Spatial Data for Wildland Fire and Fuel Management* (2002) (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” (DOI, 2001a).

In this case, Alternative 2 is the environmentally preferred alternative for Guilford Courthouse National Military Park 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 and help protect park resources and adjacent lands from the threat of wildfires. 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

Guilford Courthouse National Military Park will collect information on fuel reduction efforts, vegetative resources, and other objective dependant variables after a wildland fire. During fire events, data will be collected regarding the current fire conditions, such as fuel and vegetation type, anticipated fire behavior and fire spread, current and forecasted weather, smoke volume and dispersal, etc.

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*

- *RM-18*, chapter 9, provides minimum impact suppression tactics (MIST) guidelines. All suppression guidelines will follow MIST guidelines. The park FMO will provide input in the selection and implementation of minimum impact suppression tactics for any wildland fires that go into extended attack. Some include:
 - Keep fire engines or slip-on units on existing roads;
 - Restrict the use of heavy equipment such as bulldozers or plows for constructing fire lines. A tractor with box blade or disc will be used for fire line construction only in extreme situations when high value resources are at risk, and then only with the authorization of the superintendent or designee;
 - Prohibit the use of fire line explosives;

- Use existing natural fuel breaks and human-made barriers, wet line, or cold trailing the fire edge in lieu of handline construction whenever possible;
- Keep fire line widths as narrow as possible when they must be constructed;
- Avoid ground disturbance within known natural and archeological/cultural/historic resource locations. When fire line 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;
- Use soaker hose, sprinklers or foggers in mop-up; avoid boring and hydraulic action;
- Protect 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 *Air and Water Resources*

- 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 whenever possible. If retardant must be used, a non-fugitive type will be chosen, and bodies of water avoided.

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 *Human Health and Safety*

- Only fully qualified (i.e. meeting NPS qualifications and accepted interagency knowledge, skills and abilities for the assigned fire job), red-carded 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.
 - Slope reversal.
 - Rolling burning materials.
 - Stinging/biting insects, ticks, and poisonous snakes.
 - Dehydration, heat exhaustion and heat stroke.

- When smoke impacts roadways, the park will post “Smoke on Road” signs, reduce the posted speed limit, escort vehicles with a well-marked law enforcement vehicle as necessary; and close the effected roads to traffic when necessary;
- 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 superintendent at Guilford Courthouse National Military Park or designee may, as a safety precaution, temporarily close all or part of the park to the visiting public.
- 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.

2.3.5 Cultural and Natural Resources

- Natural and 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 natural resources program managers will coordinate with the Southeast Archeological Center to ensure that Guilford Courthouse National Military Park has the most current data regarding archeological resources within its boundaries. Recommendations will be provided on how to mitigate adverse effects (including the effects of smoke) to these resources during fire management activities, and will coordinate compliance with Section 106 of the National Historic Preservation Act, as appropriate.
- Historic structures will be protected from wildland fire via defensible space around each (minimum of 50 feet around buildings), which may consist of nonflammable material (asphalt, concrete), or a lack of fuel resulting from non-fire applications.

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 Guilford Courthouse National Military Park 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.	Short Term Recovers in less than 3 years Long Term 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; localized and indirect 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 an 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	Short Term Recovers in less than 1 year Long Term Takes more than 1 year to recover

Table 2-2 Impact Definitions

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 along with 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 a canopy tree; 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	Temporary 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; temporary 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 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>

Table 2-2 Impact Definitions

Key Resources	“Minor” Impact	“Moderate” Impact	“Major” Impact	Duration
<p>Visitor Use & Experience</p>	<p>Temporary 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 affect 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., 3 to 5 years until new vegetation returns)</p> <p>Long term Because most cultural resources are non-renewable, any effects would be long term</p>

Table 2-2 Impact Definitions

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 Preferred Alternatives in detail.

Table 2-3 Comparison of Alternatives’ Responses to Project Need, Objectives, Important Issues, and Impact Topics

	Alternative 1 No Action Alternative	Alternative 2 (Preferred Alternative) Suppress Wildland Fires, Manual/Mechanical Thinning of Hazardous fuels, and Hazardous Fuels Breaks	Alternative 3 Suppress Wildland Fires, Prescribed Fire Treatments, and Hazardous Fuels Breaks
Project Need			
Reduces hazardous fuels	Yes, but only in those areas where mechanical thinning is done; past 30-foot wide hazard fuels break along the parks boundary maintained	Yes, hazardous fuels accumulations would be mechanically reduced and maintained within three areas totaling ~59 acres. A 15 foot wide hazard fuels break would also be created along either side of the park’s entrance road totaling 6.75 acres; past 30-foot wide hazard fuels break along the parks boundary maintained	Yes, hazardous fuels accumulations would be reduced and maintained using prescribed fire within three areas totaling ~59 acres. A 15 foot wide hazard fuels break would also be created along either side of the park’s entrance road totaling 6.75 acres; past 30-foot wide hazard fuels break along the parks boundary maintained
Restore and protect the historic landscape	Yes, mechanical thinning activities would protect the historic landscape and scenic vistas by stopping the encroachment of woody vegetation and exotic invasive species	Yes, mechanical thinning activities would protect the historic landscape and scenic vistas by stopping the encroachment of woody vegetation and exotic invasive species	Yes, thinning and prescribed fire activities would protect the historic landscape and scenic vistas by stopping the encroachment of woody vegetation and exotic invasive species

Table 2-3 Comparison of Alternatives' Responses to Project Need, Objectives, Important Issues, and Impact Topics

	Alternative 1 No Action Alternative	Alternative 2 (Preferred Alternative) Suppress Wildland Fires, Manual/Mechanical Thinning of Hazardous fuels, and Hazardous Fuels Breaks	Alternative 3 Suppress Wildland Fires, Prescribed Fire Treatments, and Hazardous Fuels Breaks
Impact Topics			
Geology and Soils	Very minor short-term soil erosion impacts resulting from thinning and fire suppression activities	Very minor short-term soil erosion impacts resulting from thinning, from maintaining and creating hazardous fuels breaks and hazardous fuels reduction, and fire suppression activities	Very minor, localized and short-term soil erosion impacts resulting from maintaining and creating hazardous fuels breaks and prescribed fire use; benefits to soil development and soil nitrification with prescribed fire use; decreased potential for high-severity fire in the future and direct soil impacts
Water Resources	No water resources impacts	No water resources impacts	No water resources impacts
Vegetation	Thinning activities and hazardous fuels break maintenance would slow the encroachment of woody trees and shrubs into open fields and scenic vistas; soil disturbances resulting from fire management activities could result in the spread of invasive exotics	Plant habitat and diversity improved noxious weed species reduced as areas move from Condition Class 2 to Condition Class 1; fuel loadings reduced on ~66 acres acres; soil disturbances resulting from fire management activities could result in the spread of invasive exotics	Plant habitat and diversity improved; native vegetation favored; noxious weed species reduced; fuel loadings reduced on 59 acres; benefits to soil development and soil nitrification on 59 acres; soil disturbances resulting from fire management activities could result in the spread of invasive exotics
Wildlife	Wildlife benefits resulting from historic fire regime not realized; thinning and maintenance on hazardous fuels break would temporary displace some wildlife species; no impact on T&E or Sensitive species	Wildlife benefits resulting from historic fire regime not realized; thinning and hazardous fuels reduction activities would temporary displace some wildlife species; individual mortality of some species likely; no impact on T&E or Sensitive species	Thinning and prescribed fire activities would temporary displace some wildlife species; individual mortality of some species likely; no impact on T&E or Sensitive species; wildlife habitat improved in the long-term with restoration of historic fire regime
Air Quality	No air quality impacts	No air quality impacts	Very minor and temporary effects resulting from prescribed fire; no smoke impacts on sensitive receptors

Table 2-3 Comparison of Alternatives' Responses to Project Need, Objectives, Important Issues, and Impact Topics

	Alternative 1 No Action Alternative	Alternative 2 (Preferred Alternative) Suppress Wildland Fires, Manual/Mechanical Thinning of Hazardous fuels, and Hazardous Fuels Breaks	Alternative 3 Suppress Wildland Fires, Prescribed Fire Treatments, and Hazardous Fuels Breaks
Visitor Use and Experience (including Park Operations)	Very minor and short-term impacts during thinning activities (e.g. trail closures or limited access to certain areas, presence of work crews in the vista)	Minor and short-term impacts during hazardous 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 from maintaining and creating hazardous fuels breaks and prescribed fire use; (e.g. trail or road closures, presence of work crews in the vista); no effect on park operations
Human Health & Safety	Human health and safety marginally improved with decreased fire danger to the park and adjacent communities with continued maintenance of hazardous fuels break; potential for injury from thinning activities	Human health and safety marginally improved with decreased fire danger to the park and adjacent communities with continued maintenance of hazardous fuels break; potential for injury from thinning activities	Human health and safety marginally improved by reducing fire danger to the park and adjacent communities; potential for injury from thinning activities and fire suppression activities; very minor exposure to smoke by workers and the public during prescribed fire
Cultural Resources	No impact to known cultural resources; slight potential for impacts to un-recorded sites	No impact to known cultural resources; potential for impacts to un-recorded sites	No impact to known cultural resources; potential for impacts to un-recorded sites

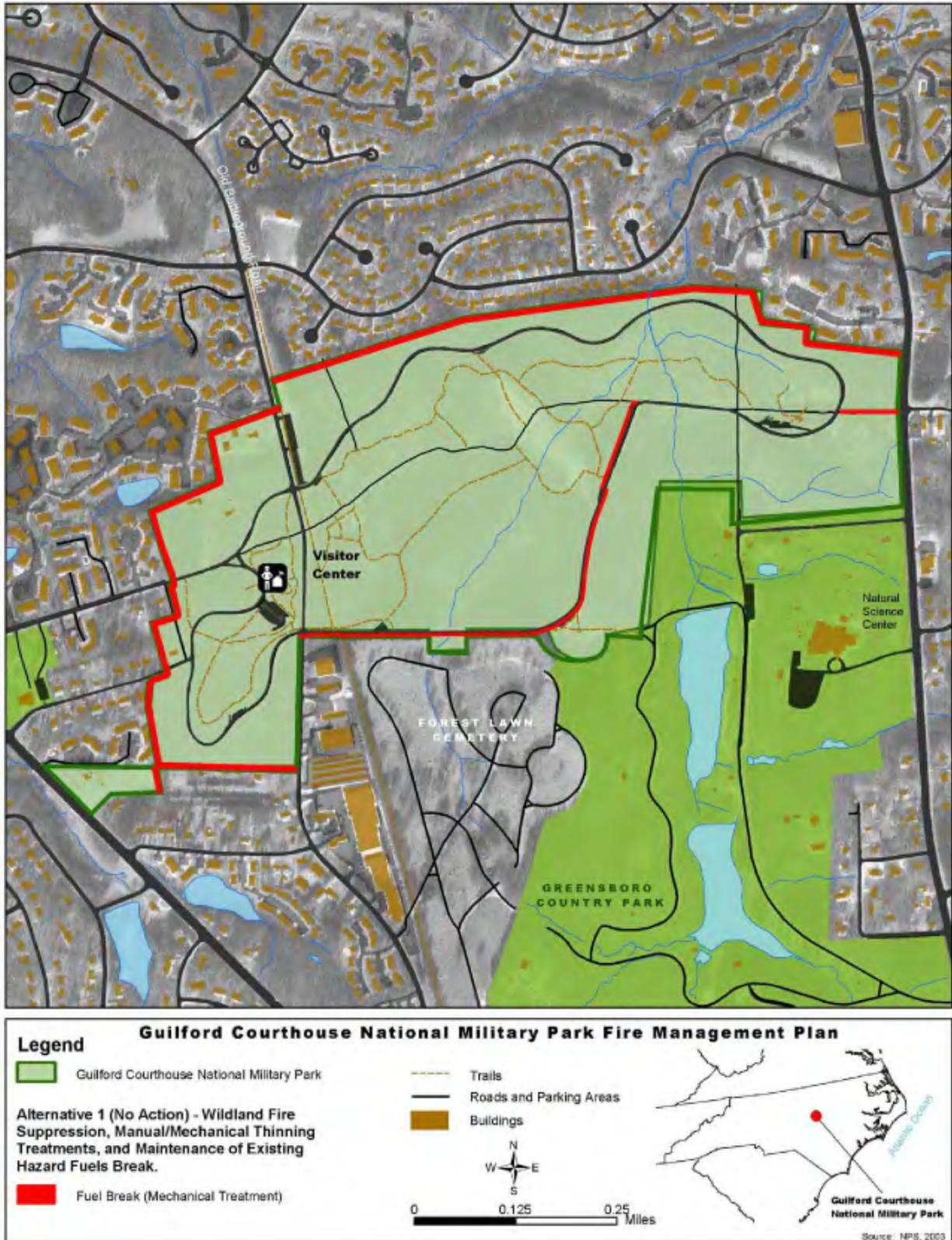


Figure 2-1 Guilford Courthouse National Military Park – Alternative 1

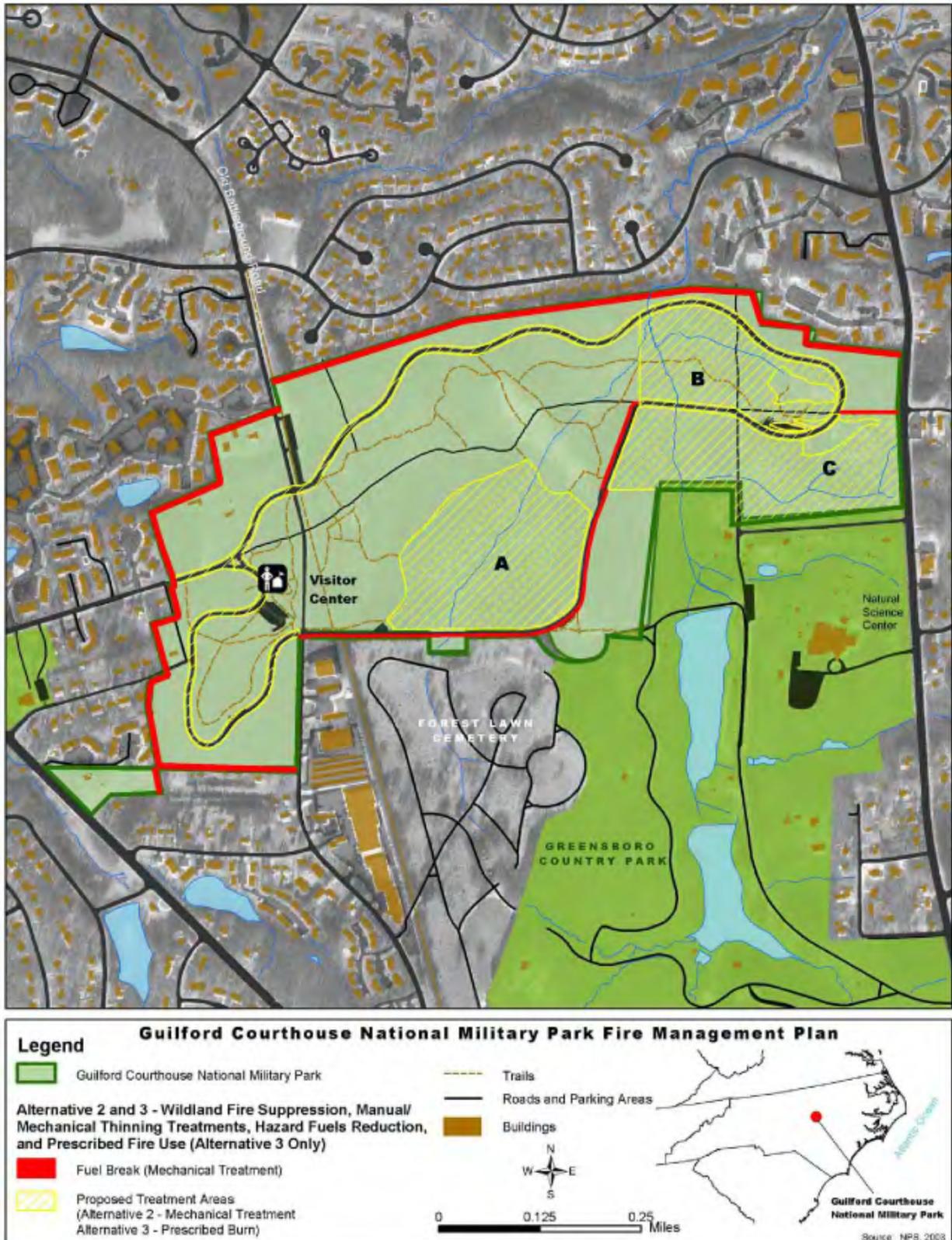


Figure 2-2 Guilford Courthouse National Military Park – Alternative 2 (Preferred) and 3

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.

3.1 SOILS AND GEOLOGY

3.1.1 *Affected Environment*

The park's terrain consists of low rolling hills, broken in places by moderately steep ravines. Soil series represented within the park include Cecil, Madison, and Wehadkee. Cecil sandy loam (2-6% slopes) is the most common soil type, underlying most of the upland portion of the park, or roughly 90% of the land area. Both Cecil and Madison series consists of very deep, well-drained moderately permeable soils on ridges and side slopes of the Piedmont uplands. The Wehadkee series consists of deep poorly drained and very poorly drained soils on flood plains along streams that drain from the mountains and piedmont (USDA, 2001a). Historic cultivation within current park boundaries, much of it intensive, largely occurred on Cecil sandy loam; as a result, the soils under most of the eastern third of the park are considered to be eroded versions of this type. Cecil urban land complex consists of areas of Cecil sandy loam that have been heavily disturbed or developed by humans. Madison sandy loam occurs on fairly steep slopes on both sides of Richland Creek. Wehadkee silt loam is only found on the bottomlands of Richland Creek and the old Lake Wilfong bed.

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 fire lines, thinning and maintenance of existing hazardous fuels breaks.

Very minor and localized soil compaction would occur from wildfire suppression and maintenance activities. Fire line construction during wildfire suppression would result in soil disturbance and could lead to increased erosion, especially in steeply sloped areas within the park. To avoid these potential impacts, fire lines would be located outside of highly erosive areas, steep slopes, and other sensitive areas. Following fire suppression activities, fire lines would be re-contoured, water barred, and seeded with native grasses

The Park would use limited, selective thinning of hardwoods and invasive species encroaching upon open fields, existing hazardous fuels breaks, and historic vistas, as well as hazard trees as

needed. Additionally, thinning activities would focus primarily on small diameter hardwoods. This limited amount of manual and mechanical thinning (*e.g.* chainsaws and bush hog) proposed by the park would result in short-term minor and localized soil compaction and soil erosion.

3.1.2.2 Alternative 2 –Preferred Alternative

Proposed activities with the potential to impact soils include building fire lines, maintaining existing and creating new hazardous fuels breaks, and hazard fuels reduction activities.

General soil impacts, with regards to fire suppression and manual/mechanical thinning activities, would be similar to those described under the “No Action” Alternative. However with the added 6.75 acres of hazard fuels reduction activities there would be increased potential for localized soil compaction and disturbance from off-road vehicle and tractor used in conjunction with hazard fuels reduction activities. However, restricting work based on ground moisture conditions would mitigate erosion, rutting, and excessive compaction by equipment.

3.1.2.3 Alternative 3

Proposed activities with the potential to impact soils include wildland fire suppression activities, maintaining existing and creating new hazardous fuels breaks, and prescribed fire.

The impacts of wildland fire suppression activities, thinning, and hazardous fuels break maintenance on soils would be similar to those described under the “No Action.” Creation of 6.75 acres of additional hazardous fuel breaks would increase the potential for localized soil compaction and disturbance on these acres from off-road vehicle and tractor used in conjunction with hazard fuels reduction activities. However, restricting work based on ground moisture conditions would mitigate erosion, rutting, and excessive compaction by equipment.

The use of prescribed fire under this alternative would have beneficial impacts to the soil. Prescribed fire would release nutrients into the soil and the fertilization effects of ash would provide an important source of nutrients for vegetation in the area. 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). However, 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. Unlike many fuel types in the western part of the country (*e.g.* ponderosa pine), the types of fuels found in Guilford Courthouse National Military Park are such that they would rarely support such a high-severity fire.

Conclusion

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.

3.2 WATER RESOURCES (INCLUDING FLOODPLAINS)

3.2.1 Affected Environment

Two small streams drain Guilford Courthouse National Military Park. The larger of the two, Richland Creek, enters the park from the south from the adjacent Greensboro County Park. This municipal park dams the creek in two successive small lakes before it flows into National Park land. Richland Creek picks up a small tributary within the park near the trail leading from the historic site of Guilford Courthouse. This tributary begins as a small stream within the park adjacent to the Forest Lawn Cemetery.

The limited aquatic resources of the park have received a fairly complete water quality inventory. Between July 1996 and February 1998, a series of monthly samples were taken from Richland Creek. These samples were analyzed for a wide variety of metals, nutrients, bacteria, and standard field parameters. The only parameters that exceeded acceptable levels were fecal coliform and fecal streptococci. Ducks and geese found on and around the aforementioned small lakes in Greensboro County Park may contribute to the high bacterial counts in Richland Creek. In 2001, the creek was ranked as degraded by the National Park Service Inventory and Monitoring Program (NPSIMP) of the Southeast Regional Office, Cumberland/Piedmont Network.

3.2.2 Environmental Consequences

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

3.2.2.1 Alternative 1 – No Action

Proposed activities with the potential to impact water resources include building fire lines, employing fire retardants or foams, and thinning; however, in light of the mitigation measures employed during fire management activities (*e.g.*, water will be used instead of fire retardant whenever possible, restricting the use of heavy equipment for constructing fireline, there would be little, if any, direct impacts on surface water resources in the park. The potential for an increase in turbidity and sediment delivery into the streams within the park 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.

The use of fire retardants or foams could potentially cause short and long-term impacts to water resources if misapplied or mishandled. Retardants contain ammonia and phosphate or sulfate ions, which can change the chemistry of a water body, thus making it lethal to fish and other aquatic organisms. Foams contain detergents that can interfere with the ability of fish gills to absorb oxygen. The degree of impact would depend on the volume of retardant/foam dropped into the water body, the size of the water body, and the volume of flow in the stream or river. For example, if a 800-gallon drop is made into a fast flowing river, it is likely that the lethal effects to aquatic resources will be short-lived as dilution below the toxic level is quickly achieved. On the other hand, a 3,000-gallon drop in a stagnant pond would likely cause toxic levels to persist for some time (USDA, 2001b). However, since mitigation measures limit the use, type, and proximity to water bodies of fire retardants, impacts to water quality will be minimal. Manual and mechanical thinning and suppression activities would not affect the overall water quality of the streams associated with Guilford Courthouse National Military Park.

3.2.2.2 Alternative 2– Preferred Alternative

Proposed activities with the potential to impact water resources include building fire lines, employing fire retardants or foams, and thinning. General water resources impacts under Alternative 2 would be similar to those described under the “No Action” Alternative. Hazardous fuels reduction would have no immediate impact on water resources in the park due to the locality of the hazardous fuels reduction treatment areas, and mitigation measures aimed at minimizing impacts.

3.2.2.3 Alternative 3

Proposed activities with the potential to impact water resources include building fire lines, employing fire retardants or foams, thinning, and prescribed fire. Impacts as a result of fire suppression and thinning activities would be the same as the “No Action” Alternative and Alternative 2. In light of the mitigation measures employed during fire management activities (e.g. limits on fire line construction; limited use of fire retardants), and the location of the treatment units, there would be little, if any, direct impacts on surface water resources on the park.

The use of prescribed fire increases the potential for an increase in turbidity and sediment delivery to the park’s streams and rivers as a result of soil erosion. However, these impacts would be minor due to mitigation measures taken by the park as described in Section 2.3.2, and also the degree of soil erosion would be minor and localized, and thus any increase in turbidity and sedimentation would also be minor and temporary as described under Section 3.1.2.2.

Conclusion

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

Guilford Courthouse National Military Park is covered by a modified second growth oak-hickory forest interspersed with stands of deciduous hardwoods and loblolly pine. NatureServe recently completed a vascular plant inventory of the park and has recorded 346 vascular plant species located within the park. As per the report entitled *Vascular Plant Inventory and Plant Community Classification for Guilford Courthouse National Military Park* (NatureServe, 2003), eleven distinct vegetation associations exist at the park, however, only four of the eleven associations, the Acidic Piedmont Mesic Mixed Hardwood Forest, the Piedmont Dry-Mesic Oak-Hickory Forest, the Southern Red Oak-White Oak Forest, and the Piedmont Small Stream Sweetgum Forest are considered "natural." The remaining seven are considered "semi-natural" (successional) or exotic species-dominated.

There are many known exotic plant species found within the park. While a good number of these include ornamental species and pose no threat to the surrounding vegetative communities, some introduced species out-compete native plants for space, food, or water. Others may also alter natural disturbance regimes and other ecological processes (e.g. change fire regimes, create shade), making it difficult or impossible for native species to survive. Table 3-1 lists those invasive species that pose the greatest threat within Guilford Courthouse National Military Park, as noted by park personnel.

Table 3-1 Common Invasive and Exotic Plant Species at Guilford Courthouse National Military Park

Common Name	Scientific Name	Habitat
Japanese honeysuckle	<i>Lonicera japonica</i>	Fields, forest edges and openings, disturbed woods, and floodplains (USDA, 2002b).
Multiflora rose	<i>Rosa multiflora</i>	Multiflora rose frequently colonizes roadsides, old fields, pastures, prairies, savannas, open woodlands, and forest edges, and may also invade dense forests where disturbance provides canopy gaps. It is most productive in sunny areas with well-drained soils (USDA, 2002b).
Chinese Privet	<i>Ligustrum sinense</i>	Old fields, primary woodlands, and closed canopy forests. In Tennessee, the species has been recorded in calcareous glades and barrens and in deciduous cove forests (TNC, 2000)
Wisteria	<i>Wisteria spp</i>	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 (TNC, 2002).
Autumn olive	<i>Elaeagnus umbellata</i>	Autumn olive occurs in disturbed areas, successional fields, pastures, and roadsides, where it has been widely planted. It has been noted from prairies, open woodlands, and forest edges. Autumn olive rarely is encountered in dense forests or in very wet sites (USDA, 2002b).

3.3.2 *Environmental Consequences*

Vegetation impacts were qualitatively assessed using literature reviews and quantitatively assessed by acres impacted.

3.3.2.1 Alternative 1 – No Action

Proposed activities with the potential to impact vegetation would include wildland fire suppression activities, and thinning treatments. Manual and mechanical thinning would involve limited, selective thinning of woody shrubs and trees less than 2 inches dbh, and exotic invasive species encroaching upon open fields, and the park's 30-foot hazard fuels break. Additionally, mechanical thinning efforts would involve the mowing of grassy areas.

Fire suppression and thinning activities could result in the mortality of native plants and trees in the areas where wildland fire suppression or thinning is being taken place. The digging of firelines and removal of trees and other woody vegetation are examples of wildland fire suppression and management activities that could cause mortality of plant species. These impacts are expected to be minor because the loss of individual members of a given plant species, however, would not jeopardize the viability of the populations on and adjacent to the park and limited to the area of treatment only. These impacts would be temporary, as native vegetation would be expected that plants would recolonize after wildland fires had occurred. However, any fire suppression, thinning and maintenance activities that resulted in soil disturbance (e.g. building of fire lines, inadvertently denuding the soil of vegetation) would have minor impacts by making those areas more susceptible to the spread of invasive exotics that thrive in open disturbed areas such as Japanese honeysuckle, multiflora rose, wisteria, and autumn olive. Disturbed areas may be seeded with native grasses and would be monitored to guard against such infestations. Coupled with mitigation measures aimed at reducing soil damage, manual/mechanical-thinning activities would also help reduce the extent of existing invasive and exotic infestations in the park. Through the removal of exotic vegetation in these areas, a competitive advantage would be given to native species.

3.3.2.2 Alternative 2 - Preferred Alternative

Proposed activities with the potential to impact vegetation would include wildland fire suppression activities, thinning treatments and hazardous fuels reduction.

Under this alternative, wildland fire suppression and manual and mechanical thinning would be conducted in the same manner as the "No Action" Alternative. General vegetation impacts resulting from manual/mechanical thinning would be similar to those described under the "No Action" Alternative. Hazardous fuels reduction activities would include reducing in the amount of hazardous fuels on approximately 59 acres. In addition, a 15-foot wide hazard fuels break would be cleared along either side of the park's entrance road and any portion of the road where a fuels break does not presently exist, totaling almost 7 acres.

In general, impacts to vegetation resulting from this hazardous fuels reduction activities would be beneficial. Plant habitat and diversity improved as the forest opens up, invasive species reduced, and as those areas move from Condition Class 2 to Condition Class 1. However, any

soil disturbances resulting from fire management activities could result in the spread of invasive exotics

3.3.2.3 Alternative 3

Proposed activities with the potential to impact vegetation include wildland fire suppression activities, manual and mechanical thinning, and hazardous fuels break maintenance and creation and prescribed fire use.

The impacts of wildland fire suppression activities, thinning, and hazardous fuels break maintenance on the vegetation of the park would be similar to those described under the “No Action”. However, with the creation of 6.75 acres of additional hazardous fuel breaks along park roads increases the potential for localized soil disturbance that could facilitate the spread of invasive exotic plant species that thrive on disturbed sites. However, these impacts would be minor due to mitigation measures taken by the park as described in Section 2.3.1, and also the degree of soil disturbance would be minor and localized, keeping their spread to a minimum.

Under this alternative, prescribed fire would be employed on approximately 59 acres within the park on three separate treatment units. On these acres, 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 species by exposing mineral soil.

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, 2002a). Table 3-2 summarizes the fire effects on several of the more pernicious invasive plants found in the park.

Table 3-2 Effects of Fire on the Most Troublesome Invasive and Exotic Plants Common to Guilford Courthouse National Military Park

Common Name	Fire Affects
Japanese honeysuckle	After being top-killed by fire, Japanese honeysuckle sprouts vigorously from the root crown and can reach or exceed pre-fire composition percentage (USDA, 2002b).
Wisteria	No data on fire affects available, however, wisteria will continue to resprout after above ground vegetation is removed, until roots stores are exhausted (TNC, 2002).
Autumn olive	Prescribed burning has not proven effective in controlling established autumn olive. (Mohlenbrock, 1990).

If honeysuckle and/or wisteria were found in treatment units where prescribed fire was to be conducted, the park would need to employ other treatments, such as additional manual/mechanical thinning, to ensure the growth of these invasive plants would not be promoted under a prescribed fire regime.

Conclusion

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

A variety of wildlife resources inhabit the forests and grasslands of Guilford Courthouse National Military Park including ungulates, small mammals, birds, reptiles, amphibians, and invertebrates. Some common species include white-tailed deer (*Odocoileus virginianus*), red-fox (*Vulpes vulpes*), eastern cottontail rabbit (*Sylvilagus floridanus*), raccoon (*Procyon lotor*), gray squirrel (*Sciurus carolinensis*), opossum (*Didelphis virginiana*), and groundhog (*Marmota monax*). A herpetofaunal survey is currently underway at the park, while extensive aquatic vertebrate, avifaunal, and mammal and bat surveys are scheduled to begin next year.

Migratory birds common to Guilford Courthouse include:

- Yellow-billed Cuckoo
- Yellow-bellied Sapsucker
- Red-breasted Nuthatch
- Brown Creeper
- Winter Wren
- Golden-crowned Kinglet
- Ruby-crowned Kinglet
- Gray-cheeked Thrush
- Wood Thrush
- Gray Catbird
- Red-eyed Vireo
- Northern Parula
- Black-throated Blue Warbler
- Yellow-rumped Warber
- Black & White Warbler
- American Redstart
- Ovenbird
- Northern Waterthrush
- Common Yellowthroat
- Summer Tanager
- Scarlet Tanager
- White-throated Sparrow
- Dark-eyed Junco

There are no known federal or state listed wildlife species that reside within the park. No designated critical habitat is known to exist within the park. However, coordination with the U.S. Fish and Wildlife Service and the North Carolina Natural Heritage Program revealed that two federally and state-listed species could potentially occur here, these include:

- Bald Eagle (*Haliaeetus leucocephalus*) – federally and state-listed as threatened
- Carolina darter (*Etheostoma collies*) – federally and state-listed species of concern

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 fire lines, fire retardant use associated with suppression activities, and thinning.

All the fire management activities could result in the temporary 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; however, the limited amount of thinning to be conducted would not adversely affect the viability of the nesting populations in the park.

There would be no impacts to the bald eagle or the Carolina darter from fire management activities, in the event either was found to inhabit the park. As stated in the National Park System's 2001 Management Policies, if a 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 military park would not be affected by fire line construction or fire retardant use since mitigation measures state that water will be used whenever possible, and, if retardant must be used, it would be a non-fugitive type, and all surface waters will be avoided. Additionally, these activities would not result in significant amounts of soil erosion and sediment delivery to the park's bayous and streams, which could impact aquatic habitats.

3.4.2.2 Alternative 2 – Preferred Alternative

General wildlife impacts under Alternative 2 would include building fire lines, fire retardant use associated with suppression activities, mechanical thinning, and maintenance of existing hazardous fuels breaks would be the same as the "No Action" Alternative. General impacts with regards to reducing hazardous fuels and extending hazardous fuels breaks along the park's road would be similar to the "No Action" Alternative; however, impacts would be felt over an additional 6.75 acres.

Coordination with the U.S. Fish and Wildlife on December 11, 2003, revealed that there would be no impacts to either the bald eagle or Carolina darter from the proposed actions detailed in this alternative (see Appendix A).

3.4.2.3 Alternative 3

Proposed activities with the potential to impact wildlife include fire line construction, fire retardant use, thinning, and prescribed fire. General impacts to wildlife during these activities would be minor and would include the temporary 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. Fall and winter prescribed fires would provide forage for grazing animals, such as white tailed deer, as new plant growth emerged in the spring “green-up”. Overall wildlife habitat quality improved in the long-term with restoration of historic fire regime.

Prescribed fire activities would not directly impact nesting migratory birds since the activities would occur in the early spring, fall and winter, and would occur prior to the breeding season (generally May 15 - August 15).

Conclusion

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*

Guilford Courthouse National Military Park is designated a class II air shed under the Clean Air Act. 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. Principal sources of air pollutants in the park vicinity are the nearby Piedmont Triad International Airport, industry emissions from Greensboro, and 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, and the extent of proposed fire management 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 – Preferred Alternative

There would be no air quality impacts under this Alternative.

3.5.2.3 Alternative 3

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.

Prior to any prescribed fire, the park would request an open burning permit from the North Carolina Division of Forestry that, among other things, identifies the location and size of the proposed prescribed fire, as well as the fuel types to be burned.

Each prescribed fire plan would include smoke trajectory maps and identify smoke-sensitive areas. Fire weather forecasts would be used to correlate ignitions with periods of optimal combustion and smoke dispersal. Mitigation measures would be defined in the plan and arrangements made prior to ignition to ensure that designated resources are available if needed to implement the mitigation measures. Prescribed fire would not be implemented when atmospheric conditions exist that could permit degradation of air quality to a degree that negatively affects public health. (Federal and state air quality standards would be the basis for this decision.) Any smoke situation that arises and threatens any smoke-sensitive areas would entail immediate suppression action.

There are many “sensitive receptors” (*e.g.* residences, schools, churches) in the vicinity of the park that may be susceptible to smoke impacts from a prescribed fire. Considering the relatively small number of acres that would be affected by prescribed fire in any given year (~60 acres), and considering the major fuel types (grasses, shrubs) 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 temporary air quality impacts.

Conclusion

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 AND PARK OPERATIONS

3.6.1 *Affected Environment*

Guilford Courthouse National Military Park currently serves as an oasis of open space in a rapidly urbanizing of Greensboro. The park provides many walking/biking trails and also the historic New Garden Road Park automobile tour road. Although the park is located in an urban/suburban setting, the park offers a variety of wild flowers and small wildlife.

In 2002, over 757,000 visits were recorded in the park, down from over 858,000 the previous year. Historically, the number of visitors to the park is lower in the fall and winter than in the spring and summer.

3.6.2 *Environmental Consequences*

Recreation impacts were qualitatively assessed in light of the intensity and duration of fire management activities as they related 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 wildfire suppression, thinning, or maintenance activities from the presence of engines, fire crews, and park staff. 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. The removal of encroaching woody shrubs and trees in the scenic vistas would benefit the visual landscape of the park by preserving the historical landscape associated with the battle fought there on March 15, 1781.

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

With the aid of fire management personnel, park operations and park facilities would not be affected under this alternative. In the event of a wildfire 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 - Preferred Alternative

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

3.6.2.3 Alternative 3

Under alternative 3, visitor use and experience impacts would be similar to those described under the “Preferred” Alternative. There would also be some short-term reduction in scenic integrity as a result of charred landscape and visitor use and experience during and immediately following any prescribed fire treatments from 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, 2) smoke accumulation would be

temporary 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. Additionally, prescribed fires would be conducted during the fall and winter, which are the seasons of lowest visitor use.

Conclusion

The implementation of any of the alternatives would not impair visitor use and experience or those 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.

3.7 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 of Operations 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, assuring 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 (accidental spills, injuries from the use of fire-fighting 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.

Accidental spills of fire retardants and foams are the most likely to adversely impact human health & safety. Fire retardants used in controlling or extinguishing fires contain about 85% water, 10% fertilizer, and 5% minor ingredients such as corrosion inhibitors and bactericides. Fire suppressant foams are more than 99% water. The remaining 1% contains surfactants, foaming agents, corrosion inhibitors, and dispersants. These qualified and approved wildland fire chemicals have been tested and meet specific requirements with regard to mammalian toxicity as determined by acute oral and dermal toxicity testing as well as skin and eye irritation tests

(USDA, 2001b). However, they are strong detergents, and can be extremely drying to skin. All currently approved foam concentrates are irritating to the eyes as well. Application of a topical cream or lotion can alleviate the effects of a retardant, and protective goggles can prevent any injury to the eyes when using foams.

Fuel break construction can pose safety threats to firefighters. Injuries can occur from the use of equipment as well as from traveling overland to targeted areas for firefighting efforts during suppression efforts. While each member 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, 2000a).

Use restrictions applied to areas of wildland fires would minimize or eliminate public human health & safety concerns resulting from smoke exposure and fire injuries.

3.7.2.2 Alternative 2 – Preferred Alternative

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

The general impacts to human health & safety under Alternative 3 would be similar to those under the “No Action” Alternative.

Use restrictions applied to areas of prescribed fires would minimize or eliminate public human health & safety concerns resulting from smoke exposure and fire injuries. When using prescribed fire, mitigation measures, such as construction of fire lines, the presence of engines, and strict adherence to prescribed fire plans, would minimize the potential for an out-of-prescription burn or 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

The implementation of any of the alternatives would not have significant negative impacts on human health or safety, or those 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.

3.8 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.

3.8.1 *Affected Environment*

The park in its entirety was administratively listed in the National Register of Historic Places (NRHP), with the passage of the National Historic Preservation Act in 1966. A formal nomination was completed and approved in 1978, with additional documentation completed and approved in 1996. The park constitutes part of the larger Guilford Courthouse Historic District, listed in the NRHP.

As per the 1996 documentation, the superintendent's residence (Residence #1), a maintenance building (Utility Building), an inflammable storage building, stone drains and culverts, New Garden Road, and the archeological site of Guilford Courthouse are contributing elements to the historic district's significance that are located within park boundaries.

- Residence #1 (HS-31, LCS 91444): This is a two-half-story, side-gable roof, Colonial Revival style house with a one-story porch extension at the east gable end. Exterior walls are brick on the main house and beaded weatherboard siding on the porch. The roof is covered with terra cotta tiles. This building, and the Utility and Inflammable Storage buildings, both described below, were erected as part of a 1934-1935 Public Works Administration (PWA) program to improve park facilities that were in place at the time of the area's 1917 transfer from the Guilford Battle Ground Company to the War Department, and which remained largely unaltered at the time of the 1933 accession of the War Department areas by the National Park Service.
- Utility Building (HS-32, LCS 91445): This is a two-story, side-gable roof, Colonial Revival style L-plan building of wood frame construction with a concrete foundation, beaded weatherboard siding, and a clay tile roof.

- Inflammable Storage Building (HS-33, LCS 91446): This is a one-story, side-gable building with a concrete foundation, brick walls, and a clay tile roof, constructed for the storage of flammable and hazardous materials.
- Stone Drains and Culverts (HS-34, LCS 91447): This historic structure consists of approximately eight stone culverts and eighteen drainage ditches found along the tour road, New Garden Road, and Old Battleground Road within the park, built by the National Park Service in 1937-1938. Constructed of rock-faced cut granite, a representative box culvert measures 15.5' wide by 4' high. Drainage ditches are also of cut granite and are approximately 4' wide.
- New Garden Road (HS-30, LCS 12210, Reconstruction): This 10'-wide road running east to west through the park, was a wagon road from Hillsboro to Salisbury during the Revolutionary War period. The road was abandoned in the early nineteenth century. The Guilford Battle Ground Company reopened the road for visitor access when it created the park. As the surrounding urban area grew in the twentieth century, the road was paved and became a major thoroughfare. In 1974-1975, the National Park Service closed the majority of the road within park boundaries in order to reduce traffic and reconstruct the historic road. Originally listed in the 1978 nomination, the road's status was clarified in the 1996 documentation as a reconstruction of an historic resource.
- Guilford Courthouse, Archeological Site: Originally listed in the 1978 nomination, the courthouse's status was clarified in the 1996 documentation as an archeological site. No physical remains of the building are extant. The location, however, is known, and the site has the potential to yield information important to the history of the battle and settlement in the area.

Two resources, Old Bruce Road and Reedy Fork Road, were included as contributing elements in the 1978 nomination. However, because their locations are unknown, they were determined to be ineligible for listing in the 1996 documentation.

Cultural Landscape

A geographic area (including both cultural and natural resources and the wildlife or domestic animals therein), associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values.

Component Landscape

A discrete portion of the landscape that can be further subdivided into individual features. The landscape unit may contribute to the significance of a National Register property, such as a farmstead in a rural historic district. In some cases, the landscape unit may be individually eligible for the National Register of Historic Places, such as a rose garden in a large urban park. (Source: NPS 2002)

As per the draft Guilford Courthouse National Military Park Cultural Landscape Report, there is one cultural landscape and two component landscapes, these include:

- Guilford Courthouse Battlefield Landscape: This Cultural landscape contains the center positions of the first two American lines and a portion of the ground defended by the left flank of the third line, although the exact location of the latter is debatable.

- Greene Monument Component Landscape: This component landscape ranks as the most visible and frequented memorial space in the park. The Greene Monument was erected in 1915 on the park's highest point.
- Superintendent's Residence Maintenance Complex Component Landscape: This component landscape contains the above-described Colonial Revival-style Residence #1, Utility Building, and Inflammable Storage Building, as well as storage sheds. It captures the essence of what its designers were hoping to accomplish—that is to mitigate the intrusion of additional infrastructure by creating a complex that seemed to belong in or derive from its cultural surroundings.

Thirty-two park structures (including the Residence #1, Utility Building, Inflammable Storage Building, Stone Drains and Culverts, and New Garden Road) are presently included on the List of Classified Structures (LCS).

The Guilford Courthouse National Military Park Archeological Overview and Assessment (Groh and Prentice 2001) describes and assesses the known and potential archeological resources within the park, and makes recommendations regarding the need for future studies. As per the report, officers at the North Carolina Archaeological Site File have assigned the state site number 31GF44 as an umbrella number to address all the cultural components at the park, including those that predate and postdate the Revolutionary War. The Archeological Sites Management Information System (ASMIS) designations have been assigned as follow to archeological resources at the park:

ASMIS ID Archeological Resource Name

GUCO-1.00	Guilford Courthouse Battlefield
GUCO-2.00	Martinville
GUCO-2.01	Guilford Courthouse
GUCO-3.00	Great Salisbury Road/Great Road/New Garden Road
GUCO-4.00	Reedy Fork Road/Retreat Road/Hillsborough Road
GUCO-5.00	Bruce Road
GUCO-6.00	Historic Park Facilities
GUCO-6.01	Residence #1/Quarter #1/Superintendent's Residence
GUCO-6.02	Utility Building
GUCO-6.03	Inflammable Storage Building
GUCO-6.04	Stone Drains and Culverts
GUCO-6.05	Amphitheater
GUCO-6.06	Administration Building, Museum, and Visitor Center
GUCO-7.00	Cape Fear and Yadkin Valley Railroad Bed

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 wildfire suppression, thinning, and hazardous fuels reduction activities.

3.8.2.1 Alternative 1 – No Action

Proposed activities with the potential to adversely affect cultural resources include the suppression of wildfires and manual/mechanical thinning.

General impacts resulting from this alternative would be minor because the park would protect cultural resources by implementing the following fire management practices:

Under this alternative, 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 the park 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 monuments, all of which sit on concrete, stone, or brick pads, and five replica cannon, will be protected from wildland fire via mowing of the grass around them.
- During all suppression activities, the minimum impact suppression tactics policy would 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 would 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 appearance of the historic landscape and protecting identified cultural resources and cultural landscapes would be facilitated by the selective thinning of woody shrubs and trees encroaching upon open fields and historic vistas. Component landscapes would not be significantly and/or adversely altered with thinning treatments.

There would be the slight potential for fire suppression activities to affect unrecorded cultural resources within the park.

3.8.2.2 Alternative 2 – Preferred Action

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

There exists a slight potential for fire suppression activities to adversely affect unrecorded cultural resources within the park.

3.8.2.3 Alternative 3

Impacts to cultural resource sites from these activities are similar to those described under the “No Action” Alternative. As with the other alternatives, there would be the potential for fire management activities to adversely affect unrecorded cultural resource sites.

Prescribed fire use would have negligible adverse impacts on the cultural resources of the park. When using prescribed fire, mitigation measures, such as the avoidance of structures, mowed wetted fire lines 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.

Conclusion

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 EFFECTS

The cumulative effects 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 effects 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 3-3 show both positive and negative impacts resulting from a particular activity. The information provided in Table 3-3 is the basis for the cumulative effects described in Table 3-4.

Table 3-3 Cumulative Impacts of the Preferred Alternative

	Soils	Water Resources	Vegetation	Wildlife	Air Quality	Visitor Use & Experience	Human Health & Safety	Cultural Resources
Future increase in visitation to the park as amount of green space in Greensboro decreases as the city grows			-	-	-	+-	-	-
Past land acquisition in the park's authorized boundary			+	+		+		+
Increasing commuter traffic traversing through and around the park				-	-	-	-	-
Past, present, and future Improvements to Old Battleground Road, and other park roads	-	-		-		+	+	
Past, present, and future urban/residential development outside the park boundary		-	-	-	-	+-	-	
Possible future archeological investigative work within park boundaries	-		-			+		+

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

Table 3-4 Cumulative Effects

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	Past land acquisition protects soils within the park from development; improvement to park roads would have minor negative impacts on soil;	Future improvement to park roads would have minor negative impacts on soil; complete archeological survey that would require the grid-style transects and shovel tests, which would result in temporary minor soil impacts throughout the park	Prescribed fire would have temporary and minor adverse effects on soils (soil erosion, if soil is denuded), but beneficial effects as well over the short and long-terms (soil development and soil maturation); wildland fire suppression, thinning, and hazardous fuels reduction activities would result temporary minor adverse soil impacts	Fire Management Plan would not result in significant cumulative impacts; Soils inside of the park would improve over time with soil development and maturation from prescribed fires; Alternative 3 would contribute the most to positive soil cumulative impacts, while the "No Action" Alternative and Alternative 2 would contribute the least
Water Resources	Past and present urban development adjacent to the park would adversely impact water resources (turbidity, sediment delivery, pollution, water consumption)	Increased development and commercial use in areas adjacent to the park and future road improvements would directly and indirectly impact water resources (turbidity, sediment delivery, pollution, water consumption)	Prescribed fires, hazardous fuels reduction, thinning, and wildland fire suppression activities would have no direct impacts on water resources, and only indirect impacts (turbidity and sediment delivery from soil erosion)	Fire Management Plan would result in very minor cumulative effect on water resources; the "Preferred Alternative" would contribute the most to potential negative water resource cumulative impacts, while the "No Action" Alternative would contribute the least
Vegetation	Past land acquisition preserves vegetation communities; past and current development adjacent to the park alters native vegetation communities	Future road improvement projects along with the continued development of lands outside the park boundaries would have negative impacts on vegetative communities in areas adjacent to the development,	Prescribed fire and thinning activities would promote native plant species through the return of natural fire regime and the removal of invasive exotic species; any fire management activities that resulted in ground disturbance could result in the spread of invasive exotic species	Fire Management Plan would not result in significant cumulative impacts; Open forest habitat and diversity would continue to improve; invasive exotic plant species would continue to decline however Alternative 3 would contribute the most beneficial cumulative; no beneficial impacts resulting from prescribed fire use would be seen in the "Preferred" Alternative or the "No Action" Alternative
Wildlife	Past land acquisition preserve wildlife habitat and promotes diversity; past and current development adjacent to the park along with road improvements reduce wildlife habitat and fragment wildlife corridors and edge habitat	Future road improvement projects along with the continued development of lands outside the park boundaries and increased visitation would have negative impacts to wildlife by disrupting and fragmenting wildlife habitat	Prescribed fire and hazard fuels reduction and thinning activities would result in minor, short-term disturbance and displacement with minimal species loss; potential loss of individuals; prescribed fire would improve habitat and increase wildlife diversity	Fire Management Plan would not result in significant cumulative impacts; Wildlife habitat quality and diversity increases; Alternative 3 would contribute the most beneficial cumulative impacts to wildlife, while the "No Action" Alternative would contribute the least

Table 3-4 Cumulative Effects

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 practices emit pollutants and particulate matter; automobiles on and off the park contribute to some temporary deterioration in air quality and visibility	Similar effects as described in past and present activities/land uses; increased visitation increases car volume which negatively impacts air quality within the park	Prescribed fire emissions would result in very minor, short-term air quality and visibility impacts	Fire Management Plan would not result in significant cumulative impacts; Class II air quality standards would not be violated; the "Preferred" Alternative would contribute the most to air quality cumulative negative impacts, while the "No Action" and Alternative 2 would contribute the least
Visitor Use and Experience (including Park Operations)	Past land acquisition currently provides recreational opportunities for the visitor; past and future development adjacent to the park degrades historical landscape; road improvements improve visitor experience	Future improvements of park roads enhances visitor use and experience; future residential and commercial development near the park degrade the historical landscape and degrade visitor use and experience; an archeological survey of the park would provide educational benefits to the public	Prescribed fire, hazard fuels reduction and thinning activities would result in minor and temporary visitor use and experience impacts; preservation of cultural and component landscapes on the park would enhance visitor use and experience	Fire Management Plan would not result in significant cumulative impacts; Long-term enhancement of recreation resources and opportunities offsets short-term recreation inconveniences from fire management activities; the "Preferred" Alternative and Alternative 3 would contribute the most long-term positive with only short-term minor negative cumulative impacts to visitor use and experience, while the "No Action" the least
Human Health & Safety	Past development (infrastructure, hospitals) improves human health and safety in areas outside the park boundaries; road improvements create safer driving conditions	Similar effects as described in past and present activities/land uses	Prescribed fire, hazard fuels reduction and thinning activities reduces the chance of wildland fire occurring in the park; fire management activities may result in very minor impacts (cuts and bruises);	Fire Management Plan would not result in significant cumulative impacts; Fire Management activities would improve human health and safety in the event of wildfire; the "Preferred" Alternative would contribute the most to human health and safety beneficial cumulative impacts, while the "No Action" Alternative would contribute the least; Alternative 3 would also contribute beneficial cumulative impacts through hazardous fuels reduction, however, there is a very slight potential (~1%) for prescribed fire to escape containment and impact the surrounding community

Table 3-4 Cumulative Effects

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
Cultural Resources	Past land acquisition preserves the historical landscape of the battlefield; residential and commercial development degrade cultural and component landscapes on the park	Residential and commercial development degrade cultural and component landscapes on the park; an archeological survey of the park would contribute to the historical knowledge of the park	Prescribed fire, hazard fuels reduction and thinning activities preserve the historical landscape of the battlefield; potential for impacts to unrecorded cultural resources resulting from fire management activities	Fire Management Plan would not result in significant cumulative impacts; Cultural and component landscapes continue to be preserved and enhanced; the "Preferred" Alternative and Alternative 3 would contribute the most beneficial cumulative impacts to cultural resources, while the "No Action" Alternative would contribute the least

Consultation and Coordination

List of Preparers

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Jami Hammond - Southeast Regional Office, National Park Service
Stephen Ware – Chief Ranger, Guilford Courthouse National Military Park
Charles Cranfield – Superintendent, Guilford Courthouse National Military Park
John Hammond – U.S. Fish & Wildlife Service
Renee Gledhill-Early – North Carolina Department of Cultural Resources

Persons, Organizations, and Agencies Who Received this Environmental Assessment

David Robinette - Greensboro Fire Department
Keith Robertson - Greensboro Fire Department
Tim Sadler - Greensboro Police Department

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 NORTH CAROLINA STATE PRESERVATION OFFICE



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Raleigh Field Office
Post Office Box 33726
Raleigh, North Carolina 27636-3726

December 11, 2003

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

Dear Ms. Toole:

The U. S. Fish and Wildlife Service (Service) has reviewed your October 28, 2003 memorandum and draft Fire Management Plan for Guilford County Courthouse National Military Park (GUCO), located in Guilford County, North Carolina. The fire management plan is being developed in accordance with National Park Service (NPS) policy which requires every park unit with burnable vegetation to develop such a plan, to be approved by the park superintendent. The plan, "...guided by federal policy and the park's resource management objectives, will serve to protect life, property, and natural and cultural resources." Our comments are provided in accordance with section 7(a)(2) of the Endangered Species Act (Act) of 1973, as amended (16 USC 1531 *et seq.*).

The NPS contacted the Service on June 10, 2003 requesting information regarding rare and federally protected species that occur in Guilford County that might be affected by the development/implementation of the GUCO fire management plan. Your October 28, 2003 correspondence indicates that impacts to the federally-listed, threatened bald eagle (*Haliaeetus leucocephalus*) and the Carolina darter (*Etheostoma collis*), a federal species of concern, have been considered. The Park Fire Management Officer (FMO) will be responsible determining whether fire management activities may be impacting listed species and will coordinate compliance with the Service under section 7 of the Act as appropriate.

The Service believes that development and implementation of the Fire Management Plan for Guilford County Courthouse National Military Park is not likely to adversely affect the bald eagle or any other federally-listed species, their formally designated critical habitat, or species currently proposed for federal listing under the Endangered Species Act, as amended. We believe that the requirements of section 7(a)(2) of the Act have been satisfied. We remind you that obligations under section 7 consultation must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered; (2) this action is subsequently modified in a manner that was not considered in this review; or, (3) a new species is listed or critical habitat determined that may be affected by the identified action.

The draft fire management plan for GUCO includes a summary of natural communities contained on the property and includes measures that the Service finds favorable for native fish, wildlife and plants. As the plan points out, wildland fuel reduction would assist in controlling exotic plant species that compete with native species. The plan would allow the NPS to minimize fire suppression impacts by avoiding ground disturbance, minimizing tree cutting and when firefighting, using water wherever possible instead of fire retardant. These measures appear to be a reasonable approach to achieving the best natural and cultural resource management in the wildland/urban interface.

If you have any questions regarding this matter, please contact Mr. John Hammond at 919-856-4520 (Ext. 28). Thank you for your continued cooperation with our agency.

Sincerely,


for Garland B. Pardue, Ph.D.
Ecological Services Supervisor



**North Carolina Department of Cultural Resources
State Historic Preservation Office**
David L. S. Brook, Administrator

Michael F. Easley, Governor
Lisbeth C. Evans, Secretary
Jeffrey J. Crow, Deputy Secretary
Office of Archives and History

Division of Historical Resources

December 11, 2003

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

Re: Draft Fire Management Plan, Guilford Courthouse National Military Park, Guilford County, ER03-3065

Dear Ms. Toole:

Thank you for your memorandum and the accompanying document concerning the above project. We apologize for the delay in our response.

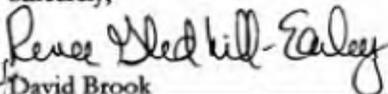
The draft fire management plan contains provisions for the protection of significant archaeological resources. These include selective thinning and removal of debris by hand as well as coordination of activities with appropriate park and archaeological personnel. Implementation of these provisions should ensure that significant archaeological resources are not affected by fire management activities.

We have recently requested copies of the reports of archaeological investigations at Guilford Courthouse National Military Park for our use in evaluating potential effects. Receipt of those reports will provide a firmer basis for our evaluations in the future.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763. In all future communication concerning this project, please cite the above referenced tracking number.

Sincerely,


David Brook

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