

**Kings Mountain National Military Park
Kings Mountain State Park
Crowders Mountain State Park State Park**



Kings Mountain Parks

Interagency Fire Management Plan

Environmental Assessment

September 2016



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Interagency Fire Management Plan

Environmental Assessment

SUMMARY

In accordance with the National Environmental Policy Act (NEPA) and federal wildland fire policy, the managers of Kings Mountain National Military Park (hereafter National Military Park or KIMO), Kings Mountain State Park (hereafter KMSP) and Crowders Mountain State Park (hereafter CMSP) are joining efforts in this Environmental Assessment (EA) for developing an Interagency Fire Management Plan (FMP).

The three parks are about a 45-minute drive from Charlotte, North Carolina, and are located along the north-central South Carolina/North Carolina border. All three parks have many similar resources and management issues, and a joint NEPA process and FMP will more effectively help reach their shared fire management goals. This EA will facilitate proposed updates in fire management strategies, fire terminology, and management of each parks' unique natural and cultural characteristics.

Policies from federal and state agencies recommend developing FMPs on an interagency basis whenever possible. Before this interagency FMP can be developed, the National Park Service (NPS), in cooperation with the two state parks, has prepared this EA. This EA is part of the process to address changes in fire management strategies, vegetation communities and fuel loading that have occurred over the years since historic settlement of the area and since the three parks were created.

This EA discusses wildland fire, which is a general term describing any non-structure fire that occurs in vegetation and natural fuels. There are two types of wildland fire: planned ignitions or unplanned ignitions. Planned ignitions are also referred to as prescribed fire or prescribed burns. Prescribed fire is any fire intentionally ignited by management under an approved plan to meet specific objectives. Unplanned ignitions are those fires not intentionally ignited by management (such as lightning and human caused) and are also referred to as wildfires. A prescribed fire that has expanded beyond the prescribed burn plan, or escaped, is also considered a wildfire. This EA evaluates three alternatives—a No Action Alternative, the Preferred Alternative, and an additional action alternative.

Under the No Action Alternative, the fire management program would continue with current fire management activities in each park; there would be no interagency FMP. Under the No Action Alternative, wildfires would continue to be suppressed, prescribed burning would occur, and treatment of non-native invasive vegetation by herbicide may all continue. Handheld mechanical equipment use (e.g., chainsaws and leaf-blowers) would continue. Negative effects could include continued accumulations of hazard fuels and potential for larger, high severity fires over time with the corresponding risk to human structures and natural and cultural resources. Forest restoration to reverse changes caused by logging, agricultural use, and fire suppression from before the parks existed would not effectively occur. The individual park approach to fire and vegetation management would prevent the synergy and funding possibilities that an interagency approach could provide.

The Preferred Alternative would allow fire management actions allowed under the No Action Alternative plus additional tools/strategies including the management of wildfires for multiple objectives including resource objectives. This means that some unplanned ignitions could be allowed to burn in some locations for natural or cultural resource improvement objectives. In addition the parks could use mechanical treatments utilizing wheeled or tracked equipment (mastication) for reducing undergrowth to aid in forest restoration and defensible space work, and use targeted herbicide treatments to aid in those efforts. These activities would be outlined in a joint interagency FMP that would allow for variances based on different park objectives at the three parks.

An additional action alternative would include the same fire management tools as discussed in the Preferred Alternative except managing wildfires for multiple objectives would not include resource objectives, so suppression management of all wildfires would be the primary response. Under this alternative the FMP would also be interagency between all three parks, but would include differences based on each parks' specific objectives.

Under all alternatives evaluated, additional project specific objectives would be included in each fuels treatment and prescribed burn plan; the treatment/prescribed burn plans would also include mitigations identified in the environmental assessment and decision document.

This Environmental Assessment (EA) has been prepared in compliance with the National Environmental Policy Act (NEPA) to provide the decision-making framework that:

1. Analyzes a reasonable range of alternatives to meet objectives of the proposed plan;
2. Evaluates potential issues and impacts to the natural and cultural resources of the National Military Park, Kings Mountain State Park, and Crowders Mountain State Park; and
3. Identifies specific and required mitigation measures that are designed to lessen the degree or extent of these impacts.

Resources determined to potentially be affected by the alternatives include air quality, water resources (including wetlands), vegetation (including invasive plants), wildlife (including invasive species), special status species, archeological and historic structure resources, cultural landscapes, visitor use and experience, and park operations. All impacts to these resources were determined to be moderate or less in intensity and duration, with many positive impacts.

Public Comment

If you wish to comment on this EA, you are encouraged to post comments online at <http://parkplanning.nps.gov/> [National Military Park](#), or you may mail comments for all 3 parks to **Kings Mountain National Military Park, 2625 Park Road, Blacksburg, SC**. You may also hand deliver written comments to the National Military Park, Crowders Mountain State Park, or Kings Mountain State Park visitor centers. This EA will be available for public review and comment for 30 days.

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment—including your personal identifying information—may be made publicly available at any time. Although you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so. Comments will not be accepted by fax, e-mail, or in any other way than those specified above. Bulk comments in any format (hard copy or electronic) submitted on behalf of others will not be accepted.

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CHAPTER 1 PURPOSE AND NEED

1.1 Introduction

The Kings Mountain area (Figure 1) is a relatively small, but prominent ridge that rises above the surrounding countryside and exhibits abundant forest, vegetation, and wildlife habitat. The area looks much different from pre-settlement conditions when lightning and/or Native American ignited fires were frequent. The frequency of these fires varied from 5 years on exposed uplands to 5–8 years in canebrake communities, and longer in partially sheltered portions of the landscape (Frost and Shedd 2015). Generally, the fires were low intensity surface fires that reduced underbrush, small trees, and forest litter and debris. Trees were larger and more widely spaced; the ground was covered with a diversity of grasses and forbs; cane breaks were more widespread in riparian areas; and “balds” or meadows with scattered clumps of trees predominated on higher ridge areas (Landrum 1897). Today, the region making up Kings Mountain and Crowders Mountain provides habitat that may support up to 15 species of plants and animals with either state or federal protection status including the Northern Long-eared Bat (*Myotis septentrionalis*)—federally threatened, Bear Oak (*Quercus ilicifolia*)—state endangered in North Carolina, and Georgia aster (*Symphotrichum georgianum*)—state threatened in North Carolina.

Congress established Kings Mountain National Military Park in 1931 to protect the site and scene of a pivotal battle in the Revolutionary War. It consists of 3,945 acres in York and Cherokee Counties, South Carolina. The National Military Park encompasses the entire battlefield from the Battle of Kings Mountain that occurred October 7, 1780. The battlefield includes the 1,200-foot Battleground Ridge, forested slopes, and stream branches that encompass the historic setting of the battle. Visitors can view interpretive signs and historic monuments to commanding officers and other historical figures associated with the Battle of Kings Mountain on the battlefield interpretive trail.

The historic battleground of the National Military Park is listed on the National Register of Historic Places. The park contains numerous historic structures that include buildings, monuments, markers, roads and historic archaeological sites. Interpretive exhibits in the visitor center display weapons, clothing, and household artifacts of rural South Carolina during the Revolutionary War. There are multiple trails for recreation. Kings Mountain State Park adjoins the National Military Park on its southeastern boundary, and provides significant recreational and pioneer history resources for visitors.

Kings Mountain National Military Park
Kings Mountain State Park
Crowders Mountain State Park



Kings Mountain Parks Interagency Fire Management Plan Area

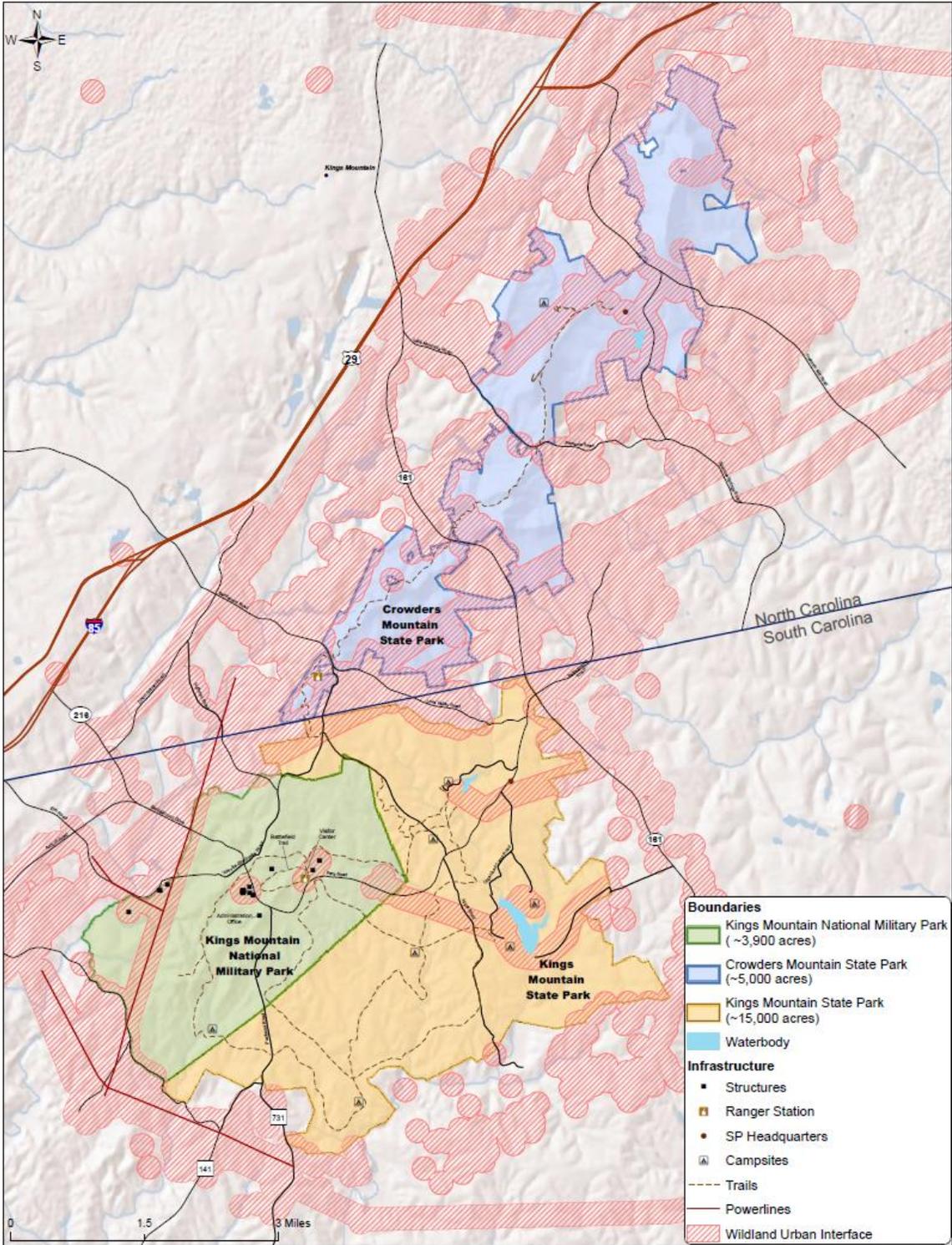


FIGURE 1. VICINITY OF KINGS MOUNTAIN AREA AND WILDLAND URBAN INTERFACE MAP

In 1934, Kings Mountain State Park was established through a donation from the U.S. Government as a recreation demonstration area. In 1994 and 1995, additional lands were purchased by South Carolina and three separate tracts were donated to bring the total acreage to 6,884. Kings Mountain State Park has miles of forested trails, some of which continue into the adjacent National Military Park and Crowders Mountain State Park, and two fishing lakes (Figure 2). Visitors flock to the park during regularly scheduled special events, especially every November when living history demonstrations are held at the park’s replica 1800s Piedmont farm. The farm is a replica of a 19th century South Carolina yeoman farm that includes a barn, cotton gin and blacksmith/carpenter shop. The Civilian Conservation Corps (CCC) was instrumental in the development of many of South Carolina’s state parks, including some of the facilities still in use at this park.

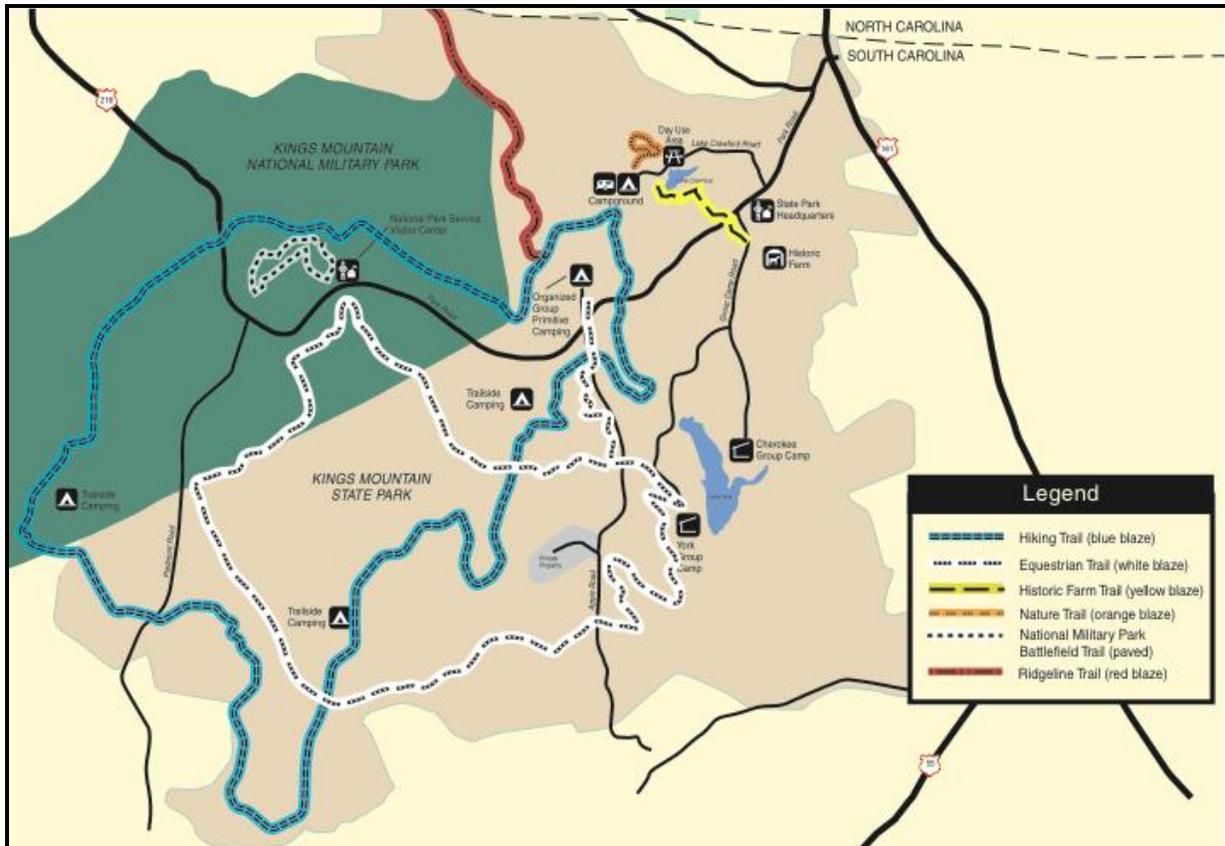


FIGURE 2. MAP OF KINGS MOUNTAIN STATE PARK

In 1974, Crowders Mountain State Park was established in the south central part of North Carolina in Gaston County, near the South Carolina state line (Figure 3). Crowders Mountain State Park contains 5,126 acres, which includes the peaks of Crowders Mountain and Kings Pinnacle that rise 800 feet above the surrounding countryside. In relation to major population centers, the park is 6 miles southwest of Gastonia, 17 miles southeast of Shelby and 25 miles west of Charlotte, North Carolina’s largest city. Crowders Mountain State Park offers a variety of hiking and biking trails, with the more rugged trails leading to the summits of Crowders Mountain (a registered natural heritage area) and Kings Pinnacle, and the flat, easy trail circling the nine-acre park lake. The Ridgeline Trail connects Crowders Mountain State Park to Kings Mountain State Park and the National Military Park. Crowders Mountain State Park also provides rock climbing, canoeing, bank fishing opportunities, and interpretative educational opportunities at the visitor center with natural history exhibits that illustrate the importance of fires as a natural ecosystem process.

The National Military Park, Crowders Mountain State Park, and Kings Mountain State Park (hereafter Kings Mountain Parks) are proposing to implement a joint Fire Management Plan (FMP). An FMP is a strategic document that provides objectives and guidelines for meeting agency requirements and park/resource

management goals and objectives. This EA evaluates three alternatives for fire management activities in the Kings Mountain Parks. This EA assesses the impacts that could result from continuing current fire management (no action alternative) or implementation of two action alternatives. This EA has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, regulations of the Council on Environmental Quality (CEQ) (40 CFR §1508.9), the NPS Director's Order (DO)-12 (*Conservation Planning, Environmental Impact Analysis, and Decision-Making*), and the North Carolina (or State) Environmental Policy Act of 1971.

Park Descriptions

Kings Mountain National Military Park

The purpose of the National Military Park is to commemorate the Battle of Kings Mountain that was fought on October 7, 1780, a pivotal and significant victory by patriot forces over loyalists to the British Crown during the Southern Campaign of the Revolutionary War.

The significance of National Military Park:

- The park preserves the entire battlefield site in a natural setting evocative of the Carolina frontier of 1780 and commemorates one of the most important Patriot victories of the American Revolution and the first major patriot victory of the Southern Campaign. This battle was recognized by both sides as a turning point in the war.
- The battle at Kings Mountain was one of the few battles of the war where the American long rifle (and the associated tactics) was the primary weapon of the patriot troops and this fact was instrumental in the outcome of the battle.
- The park contains an example (the 1803 Howser House) of Pennsylvania German architecture that was a clear departure from local building traditions and reflected Howser's wealth and status in the community.
- The Chronicle Marker is the second oldest battlefield monument (1815) in the United States.
- The park contains some of the best-preserved remnants of Colonial-era roads and trails that are associated with the route marched by the troops in the Battle of Kings Mountain campaign and which are part of the Overmountain Victory National Historic Trail.
- The park contains mixed hardwood forest resembling the upper piedmont during the 18th century. The Kings Mountain National Military Park preserves several species of concern such as the Georgia Aster and the Northern Bobwhite Quail.
- The size of the total area preserved (15,000 acres) in a continuous band of national and state parks, including Kings Mountain State Park in South Carolina and Crowders Mountain State Park in North Carolina, is important in preserving critical ecosystems.

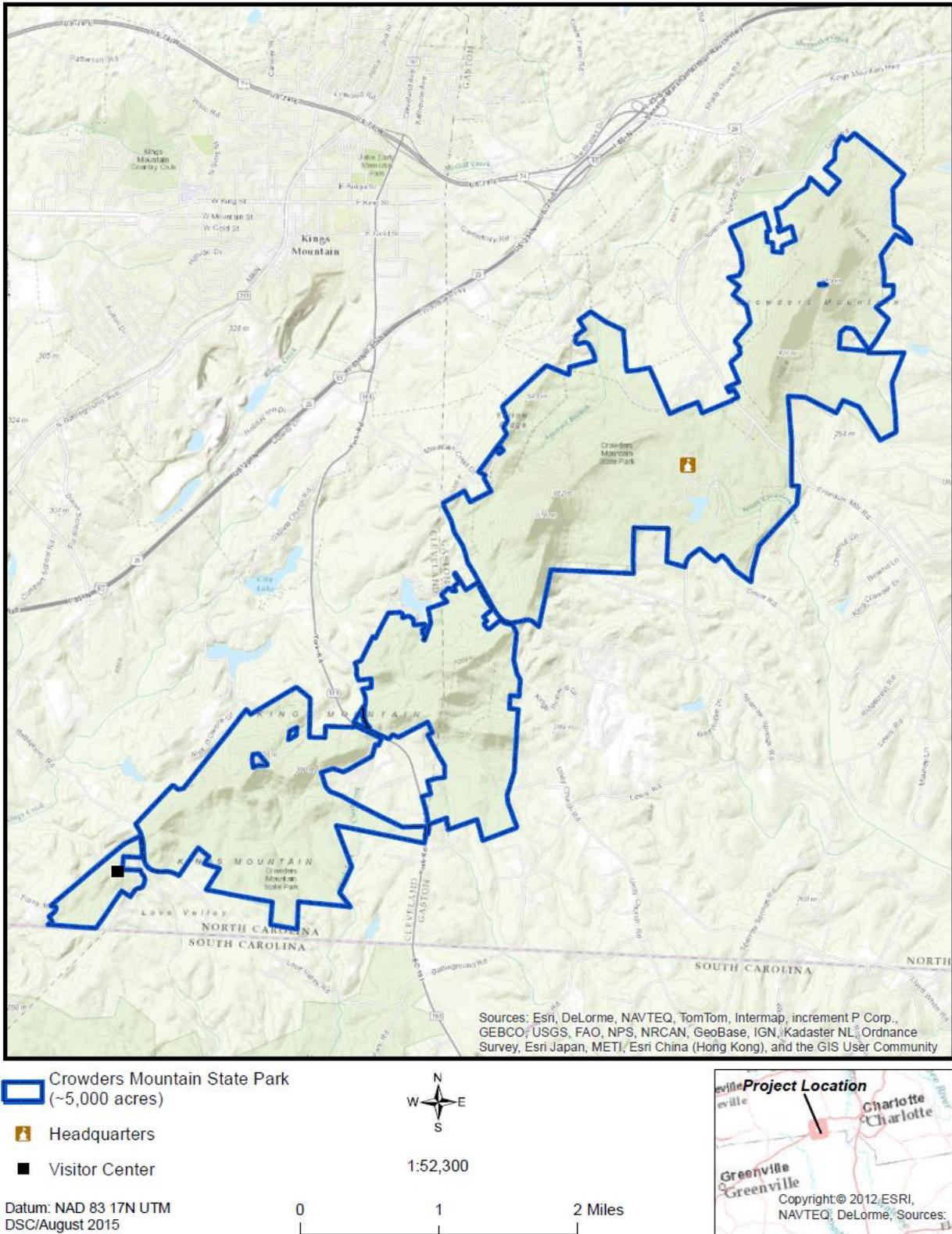


FIGURE 3. VICINITY MAP OF CROWDERS MOUNTAIN STATE PARK

Kings Mountain State Park

The purpose of Kings Mountain State Park is to be a major provider of natural, cultural and outdoor recreation experiences in the Piedmont, to maintain a large ecosystem of mostly undeveloped green space and provide educational experiences based on cultural and natural resource stewardship while providing quality visitor services.

The following goals have been determined by the South Carolina State Park Service, which includes Kings Mountain State Park (KMSP 2014):

Goal 1—To serve as responsible stewards of the diverse natural and cultural resources entrusted to the care of the South Carolina State Park Service

Goal 2—To provide quality services to our customers

Goal 3—To provide an aesthetically pleasing physical environment in parks through methods that complement the Park Service’s mission of stewardship and service

Goal 4—To manage the fiscal resources of the State Park Service in an efficient and responsible manner

Goal 5—To maximize the effectiveness of the State Park Service’s human resource

Crowders Mountain State Park

The purpose of Crowders Mountain State Park is to conserve and protect representative examples of the natural beauty, ecological features and recreation resources of statewide significance; to provide outdoor recreation opportunities in a safe and healthy environment; and to provide environmental education opportunities that promote stewardship of the state's natural heritage (CMSP 2010).

The significant resources of Crowders Mountain State Park include geological, scenic, biological, and recreation. Significant geological resources include but are not limited to quartzite hogback, unusually large bladed crystals of kyanite, and an aluminum silicate imbedded in the quartzite. Scenic resources include the contrast between rolling Piedmont hills and the sheer rock outcrops of the Kings Mountain Range. Significant biological resources include but are not limited to natural plant communities such as low elevation rocky summit, Piedmont monadnock forest, and pine-oak heath.

1.2 Purpose and Need

1.2.1 Purpose

The purpose of this proposal is to develop an interagency FMP that allows the Kings Mountain Parks to use more effective fire management strategies, use updated fire terminology, and to comply with current fire management policies and directives. For Kings Mountain National Military Park, NPS Director’s Order-18, Wildland Fire Management (DO-18; NPS 2008) requires that “all parks with burnable vegetation must have an approved FMP that will address the need for adequate funding and staffing to support its fire management program.” For Crowders Mountain State Park, the North Carolina Division of Parks and Recreation policy requires every park to develop a fire management program that coordinates wildfire response and where appropriate applies prescribed fire to restore and maintain fire-dependent natural communities. Per the South Carolina State Park Service, development of a fire management plan prior to implementing prescribed fire at Kings Mountain State Park is recommended (SC State Park Service 2009 Fire Management Manual).

1.2.2 Need

National fire policy recommends adjacent units develop interagency FMPs when feasible. Fire does not respect legal boundaries, so the most effective fire management occurs on a joint (interagency) basis. The proposed action to develop an interagency FMP would provide a management framework for all wildland fire activities in the Kings Mountain Parks. Sharing resources and fire planning and expertise for their similar fire

related issues would allow the Kings Mountain Parks to be more effective in meeting park management goals and objectives.

The joint environmental assessment and FMP will reduce duplication of NEPA and State planning requirements per CEQ Part 1506.2. In addition, the current FMPs and compliance documents do not take into consideration the northern long-eared bat (*Myotis septentrionalis*), listed as federally threatened in 2015; the three parks have suitable bat habitat and it could be found in the area. The park FMPs need to be written or updated to include updated fire management techniques, strategies, and fire terminology. Therefore, an interagency FMP is desired to effectively meet overall resource management and human protection goals.

Currently, the fire management programs at the three parks suppress all wildfires and allow prescribed fires. The parks would like to utilize national fire policy and manage wildfires for multiple objectives, including resource and protection objectives. In addition, the parks would like to use mechanical equipment (mastication) and targeted herbicide applications to aid in forest restoration and defensible space projects. Through research, observation, and monitoring the management staff of the parks have learned that more active management of vegetation is necessary to restore, protect, maintain, and perpetuate the natural and cultural values in the parks that they were created to protect. These measures would also provide more effective protection from high severity wildfires.

Historically, the landscape consisted of open woodlands with mature, widely spaced trees and grasses as the understory (Landrum 1897). Human practices in the area such as logging, grazing, farming, and settlement clearing activities plus fire suppression have altered the vegetation communities. The current successional forests and thick under-stories with high fuel loads now found in much of the area are a result of fire suppression and lack of forest management since the settlement period. Trees are smaller than historic times, and stems per acre are higher. This has created higher ground and ladder fuels, which has created a trend of increasing size and intensity of actual and potential wildfires. These types of fires may become larger, more frequent, and more difficult to control during drought conditions and with climate change. In addition, risks to visitors and area residents, park facilities, historic landscapes such as the Kings Mountain Battlefield, private property structures adjacent to the parks, and natural plant and wildlife communities may increase.

Past land practices and fire exclusion have led to changes in species composition and vegetation structure, making it difficult to restore vegetation conditions that developed during the historic period of cultural significance—Battle of Kings Mountain around 1780—and habitats within the Kings Mountain Parks. The change in vegetation structure and species composition also decreases the ecological integrity of fire-adapted vegetation communities and associated wildlife species. Vegetation growth has reduced cultural landscapes and visual landscape aesthetics due to brush and small tree encroachment. Recent research identified the need for prescribed fire to restore the landscape of the late 18th century (Florida A&M University 2006, Frost and Shedd 2015). A biological survey further supported the use of fire as a management tool (Moore 2009). The study indicated that the heavy surface fuel layer was contributing to the decline in the park's biodiversity.

All three parks have initiated programs of prescribed burning and vegetation management, but are embarking on this planning process to help provide future direction. Until the interagency FMP is completed, the parks will continue to suppress wildfires and engage in limited vegetation management activities allowed in their guidance documents. A new FMP is vital to address the need to manage vegetation and fire more comprehensively and on an interagency basis; the need to better protect facilities and neighboring private properties; the need to restore fire dependent communities and related species; and to incorporate updates in national fire policy and terminology. For the new FMP, the parks are considering pro-active strategies to more actively manage Kings Mountain vegetation and wildfire.

1.3 Objectives in Taking Actions

Objectives are purpose statements that describe what must be accomplished to a large degree for the action to be considered a success (NPS 2011). Based on consideration of the purpose and need, the parks plan to follow these broad objectives as they develop the new FMP:

1. Firefighter and public safety is the top priority.
2. Protect NPS, state and private infrastructure, facilities and property.
3. Manage and maintain historic, cultural, recreational, and aesthetic landscapes.
4. Restore and protect natural and ecological values; minimize high severity fire.
5. Manage all fires with the fewest negative consequences.
6. Promote communication and cooperation on fire management activities between agencies and the public.

Each park may develop individualized objectives that relate to the above goals and may focus on additional objectives due to agency guidance. For example, the National Military Park plans to emphasize efforts to restore and maintain the battlefield vegetation as to how it appeared during the 1780 battle. Kings Mountain State Park wants to continue defensible space protection of its living history farm area. Crowders Mountain State Park intends to reduce understory leaf litter to reduce wildfire risk, and to promote the germination of fire dependent species, such as bear oak (*Quercus ilicifolia*), as well as native grasses and ferns.

1.4 Relationship to Other Plans and Policies

For the National Military Park, the Proposed Action is consistent with the following plans and policies:

- Kings Mountain National Military Park Resources Stewardship Strategy (NPS 2012a),
- Kings Mountain National Military Park General Management Plan (NPS 2014),
- Natural Resources Condition Assessment for Kings Mountain National Military Park (NPS 2012b),
- Kings Mountain National Military Park Vegetation Management Plan (Florida A&M University, 2006),
- Strategic Plan, the Guide to Managing the National Park System, 2006 Management Policies (NPS 2006), and,
- Director Order 18, Guidance for Wildland Fire, (DO-18).
- Kings Mountain National Military Park Fire Management Plan (NPS 2000)
- Crowders Mountain State Park State Park Fire Management Plan (CMSP 1993)
- Kings Mountain State Park General Management Plan (KINGS MOUNTAIN 2014)
- Presettlement Vegetation and Natural Fire Regimes of the Kings Mountain Region (Frost and Shedd 2015)

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

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

Director’s Order 18, Wildland Fire Management, (NPS 2008) states, “Every NPS unit with burnable vegetation must have an approved FMP.” Director’s Order 18 defines what an approved FMP must include; emphasizing that firefighter and public safety is the first priority and an interagency approach to managing fires on an ecosystem basis across agency boundaries. The DO-18 also directs parks to identify, manage, and where appropriate, reduce hazard fuels.

Support for an interagency fire management plan is also supported at Crowders Mountain State Park through the CMSP General Management Plan (CMSP 2010). The Crowders Mountain State Park supports a number

of species that are known to benefit from fire, and staff developed and initiated a fire management program since the 1993 General Management Plan. Recently, Crowders Mountain State Park completed a Bear oak burn, which covered most of Crowders Mountain and the Pine-Oak Heath vegetation community and have conducted prescribed burns in the past. The park currently has a division-certified burn boss and has developed a strong collaborative prescribed fire program with the North Carolina Division of Forest Resources. The CMSP General Management Plan calls for the park’s fire management plan to be updated and for additional burn units to be developed. The establishment and implementation of an interagency FMP would be in concert with CMSP General Management Plan and assist in meeting the park’s fire management goals.

Kings Mountain State Park is still in the early stages of formalizing their forest management and prescribed burning program, but has done several collaborative prescribed burns with the NPS. The KMSP General Management Plan supports the Cooperative Wildfire Agreement it has with the National Military Park (KMSP 2014).

1.5 Impact Topics

Impact Topics Analyzed

Impact topics for this project have been identified during the internal scoping process, on the basis of federal laws, regulations, and orders, including the NPS 2006 Management Policies, and the three parks’ specific knowledge of resources at the parks. Impact topics that are carried forward for further analysis in this EA are those where the Proposed Action may have a measurable effect. There were 10 impact topics retained for further analysis. The rationale for retaining each of these topics is briefly listed below with a description of the existing setting or baseline conditions (i.e. affected environment) within the project area. Some impact topics were dismissed from further consideration when the environmental effects were estimated to be either minor or negligible. The impact topics along with the desired conditions and relevant laws, regulations, or policies are listed below in Table 1.

TABLE 1. IMPACT TOPICS RETAINED FOR FURTHER ANALYSIS AND LAWS, REGULATIONS, AND POLICIES.

Impact Topic	General Desired Conditions from NPS Management Documents	Relevant Laws, Regulations, and Policies
Air Quality	Air quality related values should be protected from deterioration, especially on a permanent basis. Perpetuate predominant air quality to sustain human health, scenic vistas, visibility, and visitor enjoyment; and to conserve natural resources and systems and cultural resources.	NPS Organic Act of 1916, as amended; Clean Air Act, as amended; NPS Wildfire Management Reference Manual 18; NPS-77 Natural Resources Management Guidelines; NPS Management Policies; National Environmental Policy Act
Water Resources (including wetlands)	Avoid diminishing the overall quality and quantity of all surface and ground water resources. Avoid altering drainage characteristics, soil hydrology, and natural movement of ground and surface waters. Minimize destruction, loss, or degradation of wetland and riparian resources from human activities, and preserve related ecosystem, natural, and beneficial values.	Clean Water Act; Fish and Wildlife Coordination Act of 1934 (PL 85-624), as amended; EO 12088; EO 11988 ; NPS Management Policies 2006; NPS-77; Director’s Order (DO) 77-2; EO 11990; Director’s Order 77-1
Vegetation	Manage vegetation to achieve greatest diversity and health, foster the health and increase state and federal listed species, and allow for	NPS Organic Act; NPS Management Policies 2006; Resource Management Guidelines (NPS-77); Federal Noxious

Impact Topic	General Desired Conditions from NPS Management Documents	Relevant Laws, Regulations, and Policies
	<p>reintroduction of native species where absent.</p> <p>Ensure that allowed activities aid in the recovery or maintenance of natural vegetation communities especially special and unique habitats.</p> <p>Ensure processes continue that sustain support of functional physical processes, biological productivity, and biological organisms.</p> <p>Prevent establishment of non-native vegetation, and remove it when possible.</p>	<p>Weed Control Act; Executive Order (EO) 13112; Invasive Species (1999)</p>
Wildlife/Wildlife Habitat	<p>Minimize disturbances to native wildlife habitat.</p> <p>Prevent wildlife exposure to contaminants.</p> <p>Minimize human caused mortality to wildlife.</p> <p>Ensure that allowed activities aid in the recovery or maintenance of wildlife habitat.</p> <p>Prevent establishment of non-native species.</p>	<p>NPS-77; Migratory Bird Treaty Act, as amended; EO 13186; Lacey Act, as amended; NPS Management Policies 2006; Invasive Species (1999)</p>
Species of Special Concern	<p>Avoid and/or mitigate adverse impacts on state and federally listed threatened, endangered, sensitive, and candidate plant and animal species and their habitats.</p> <p>Manage to maintain or increase state and federally listed threatened, endangered, sensitive, and candidate plant and animal species and their habitats.</p> <p>Ensure that allowed activities aid in the recovery of state and federally listed threatened, endangered, sensitive, and candidate plant and animal species and their habitats.</p>	<p>Endangered Species Act, as amended; NPS-77; Migratory Bird Treaty Act, as amended; EO 13186; Lacey Act, as amended; NPS Management Policies 2006; National Environmental Policy Act</p>
Archeological and Historic Structures Resources	<p>Protects archaeological resources by preventing human caused, and in some cases naturally caused destruction, alteration, or impairment to all or part of the cultural resource.</p> <p>Prevent isolation from or alteration to cultural resources with its surrounding environment.</p> <p>The qualities that contribute to the eligibility for listing or listing of archeological properties on the NRHP are protected in accordance with the Secretary of the Interior’s Standards (unless it is determined through a formal process that disturbance or natural deterioration is unavoidable).</p>	<p>National Historic Preservation Act; Executive Order 11593, Protection and Enhancement of the Cultural Environment; Archeological and Historic Preservation Act; the Secretary of the Interior’s Standards and Guidelines for Archeology and Historic Preservation; Programmatic Memorandum of Agreement Among the NPS, Advisory Council on Historic Preservation, and the National Council of State Historic Preservation Officers (2008); NPS Management Policies 2006; National Environmental Policy Act</p>
Cultural	<p>The treatment of a cultural landscape will preserve significant physical attributes, biotic</p>	<p>National Historic Preservation Act; Executive Order 11593; Archeological</p>

Impact Topic	General Desired Conditions from NPS Management Documents	Relevant Laws, Regulations, and Policies
Landscapes	<p>systems, and uses when those uses contribute to historical significance. Treatment decisions will be based on a cultural landscape’s historical significance over time, existing conditions, and use. Treatment decisions will consider both the natural and built characteristics and features of a landscape, the dynamics inherent in natural processes and continued use, and the concerns of traditionally associated peoples.</p> <p>The treatment implemented will be based on sound preservation practices to enable long-term preservation of a resource’s historic features, qualities, and materials. There are three types of treatment for extant cultural landscapes: preservation, rehabilitation, and restoration.</p> <p>Cultural landscapes are listed in the National Register when their significant cultural values have been documented and evaluated within appropriate thematic contexts, and physical investigation determines that they retain integrity. Cultural landscapes are classified in the National Register as sites or districts or may be included as contributing elements of larger districts.</p>	<p>and Historic Preservation Act; the Secretary of the Interior’s Standards and Guidelines for Archeology and Historic Preservation; Programmatic Memorandum of Agreement Among the NPS, Advisory Council on Historic Preservation, and the National Council of State Historic Preservation Officers (1995); NPS Management Policies 2006</p>
Visitor Experience & Aesthetic Resources	<p>Visitor, resident and employee safety and health are protected and considered in all management actions</p> <p>Visitors understand and appreciate park values, resources, and relationships and have the information necessary to adapt to park environments. Visitors have opportunities to enjoy the parks in ways that leave park resources unimpaired for future generations.</p> <p>Park recreational uses are promoted and regulated, and basic visitor needs are met in keeping with park purposes.</p> <p>All reasonable and necessary measures would be taken to minimize human exposure to fire management related hazards. Besides exposure to fire and smoke, this includes related equipment activities, chemical exposure, exposure to heat and environmental hazards, and work and recreational activities in a remote wilderness setting, etc.</p> <p>All reasonable efforts will be made to make park facilities, programs, and services accessible to and usable by all people, including those with disabilities.</p>	<p>NPS Management Policies 2006; National Environmental Policy Act; Americans with Disabilities Act; Director’s Orders 58; NPS Wildfire Management Reference Manual 18</p>

Impact Topics Dismissed from Further Analysis

In this section of the EA, the parks provide a limited evaluation and explanation as to why some impact topics are not evaluated in more detail. Impact topics are dismissed from further evaluation in this EA if:

- They do not exist in the analysis area, or
- They would not be affected by the proposal, or the likelihood of impacts are not reasonably expected, or
- Through the application of mitigation measures, there would be minor or less effects (i.e. no measurable effects) from the proposal, and there is little controversy on the subject or reasons to otherwise include the topic.

Due to there being no effect or no measurable effects, there would either be no contribution towards cumulative effects or the contribution would be low. For each issue or topic presented below, if the resource is found in the analysis area or the issue is applicable to the proposal, then a limited analysis of direct and indirect, and cumulative effects is presented.

Land use. Many land uses, both within formal park boundaries as well as neighboring lands are significant because of their economic, social, recreational or historical land use and practices as well as because of their past, present-day and/or potential future uses. These aspects are considered along with the beliefs, attitudes, practices, traditions, and values of traditionally associated peoples. Cultural landscapes in the context of the proposed actions are covered in detail in this EA but it was determined that other land uses in and around the parks, would have negligible effects; therefore, land use was dismissed from further analysis.

Fish/Fish Habitat. The NPS is directed by 43 CFR Part 24 to cooperatively conserve fish and fish habitat. This departmental policy recognizes the broad authorities and responsibilities of federal and state agencies with regard to the management of the nation's fish resources. There are some native fish within the parks' boundaries and in streams downstream of the parks, however, the Proposed Actions would have negligible effects on the parks' or neighboring streams running from the parks; therefore, this topic was dismissed from further analysis.

Socioeconomics. The NPS is directed to collaborate with community and tourism professionals to promote sustainable and informed tourism that incorporates socioeconomic and ecological concerns and supports long-term preservation of park resources and quality visitor experiences. Fire management, through wildfire management, suppression or prescribed burning, may benefit the economy of neighboring communities through employment and/or outside visiting fire crews utilizing community services. Otherwise, the Proposed Action would have negligible effects on socioeconomics; therefore, this topic was dismissed from further analysis.

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

Park Operations. Park operations include changes that may affect the current facilities or that may require a new level of maintenance or staffing. The action alternatives would be implemented similar to fire management project implementation in the past; utilizing staffing and resources from other parks, interagency partners and forestry agencies, and seasonal staff. The proposed alternatives would have negligible effects on the parks' operations; thus, this topic was dismissed from further analysis.

Indian Trust Resources. Secretarial Order 3175 mandates any anticipated impacts to Indian trust resources from proposed project or action by the Department of Interior agencies be explicitly addressed in environmental documents. The federal Indian trust responsibility is a legally enforceable fiduciary obligation

on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes. The parks do not have any designated Native American trust resources; therefore, Indian Trust Resources was dismissed as an impact topic for further analysis.

Soils. Impacts to soils from wildland fire activities (e.g., use of equipment and vehicles) would be negligible due to implementation of minimum impact suppression tactics (MIST). High intensity wildfires may alter soil composition and characteristics, however, the use of prescribed fires in combination with mechanical treatments, and wildfires managed for multiple objectives including resource objectives, would reduce the likelihood of impacts to soils because as the potential for high severity wildfires would be reduced. Therefore, soils were dismissed as an impact topic from further analysis in this EA.

CHAPTER 2 ALTERNATIVES CONSIDERED

Three alternatives are included in this analysis and described below. These alternatives were developed through internal and external scoping.

2.1 Elements Common to All Alternatives

The following activities already occur at all three parks. They are included here because they may affect or contribute to fire management, fire preparedness and/or defensible space and are helpful for understanding the full fire management programs. These activities would continue under all three alternatives.

2.1.1 Wildfire Suppression

Wildfires occurring within the boundaries of the Kings Mountain Parks are presently managed for suppression objectives, but not for resource objectives. Aggressive suppression, minimum cost, emphasis on firefighter and public safety, and weighing values to be protected consistent with park objectives are common objectives. Fire suppression tactics may include, but are not limited to, application of foam, water, and/or retardant by ground equipment or aircraft, limited off-road use of wildland fire engines, “burning out” from firelines or roads, potential use of heavy equipment, such as fire plows/dozers when approved by the Superintendent/Park Manager. Under state laws, state forestry agencies have responsibility for wildfire suppression in the state parks. Fire plows might be used in non-rocky, less steep park areas during major wildfires, if other alternatives are ineffective, and/or for fires that pose serious risk to life and property. Generally, roads, trails, or natural features are used for firelines and “burning” out. Fire plows are not usually allowed at the National Military Park, but could be used for fire suppression if terrain allows in an emergency with the Superintendent’s permission. Fire plows would rarely be used in Crowders Mountain State Park due to the steep and rocky terrain. The South Carolina Forestry Commission could use fireplows for wildfire suppression in Kings Mountain State Park, but would cooperate with the state park staff to avoid damage to resource values.

Fire management and suppression response options and direction come from national fire policy, chapters 7–12 in the Redbook (NIFC 2015). The single overarching priority is the protection of human life. Subsequently, management of wildfires is based on objectives and goals outlined in applicable park management plans (e.g., resource management plans, general management plans). Methods used to manage wildfires include direct and indirect tactics, dependent on conditions and resources available. Direct attack methods would include extinguishment of the fire edge with water from engines or pumps, dropping aerial retardant on the burning edge of the fire, and building firelines against the edge of the fire. Indirect attack methods might include confining the fire to burn areas surrounded by roads or other barriers, then intentional burning out vegetation along the barriers to stop the movement of the wildfire; masticating around buildings before the fire arrives to reduce fire intensity; and applying water or foam to cultural or park infrastructure sites in advance of the fire’s arrival to decrease fire behavior and intensity and protect the sites.

All three parks lack dedicated wildfire response personnel, and depend heavily on local/state agencies and interagency cooperators during larger or more complex wildfire incidents. Suppression success and effectively protecting park and local values depends on timing, fire behavior, fuel buildup, availability of firefighting resources, and other circumstances.

2.1.2 Prescribed Burning

Prescribed burning has occurred in all three Kings Mountain Parks for over a decade and will continue under all alternatives (Figure 4). The 2000 KIMO Fire Management Plan Environmental Assessment and FONSI authorized prescribed burning (NPS 2000). For the state parks, prescribed burning is authorized and regulated by the appropriate state forestry agencies and various intergovernmental agreements, and by local state park guidance documents.

The National Military Park plans to conduct an average of 700–900 acres of prescribed burning per year with a 3–5 year prescribed fire interval. Kings Mountain State Park has similar prescribed burning goals as the National Military Park, but at this time they have less funding availability and it may take additional years to achieve that level of burning as they are in the earlier stages of developing their fire management program. Crowders Mountain State Park would like to accomplish approximately 1,000 acres of prescribed burning per year.

2.1.3 Maintenance Activities

Some routine maintenance procedures for park operational reasons are performed at all three parks. Routine maintenance activities contribute to fire management creation and/or maintenance of defensible space. Examples include weed removal, mowing, fallen tree and other natural debris removal. These activities occur around buildings and infrastructure, campgrounds and picnic areas, along roadsides, along some trails, along some fences and boundaries, and on primitive roads used for fire access.

2.1.4 Easements and Right-of- Ways

Some brush clearing activities are conducted along roadsides, or by utility companies along power lines and pipeline right-of-ways through legal right-of-way or easement agreements (approved under NPS Categorical Exclusion 3.3 C.3); some easements were established prior to park establishment. Additionally, the utility corridors in the National Military Park may have targeted herbicide applications used for stumps or basal cuts of large brush. Targeted herbicide treatments are not conducted near known Georgia aster locations.

2.1.5 Herbicide Treatments

Herbicide use to control invasive non-native plants is limited to targeted spot spraying by hand application. It does not include spraying by vehicle or aircraft. NPS park units only use U.S. Environmental Protection Agency (EPA) approved herbicides and application occurs only under their specified conditions. At the National Military Park, herbicides are used after undergoing the rigorous NPS evaluation and approval process through the regional and national offices. Removing invasive non-native plants contributes greatly to forest restoration by reducing competition between native and exotic (introduced) plants, allowing native plants to recolonize disturbed areas. Herbicide treatment activities are authorized by NPS CE 3.3 E.3 (Actions related to resource management and protection) under NEPA for treatment of invasive plants at the National Military Park. Herbicide use in the state parks is administered and regulated by regional or state level management staff, but is subject to the U.S. EPA herbicide regulations.

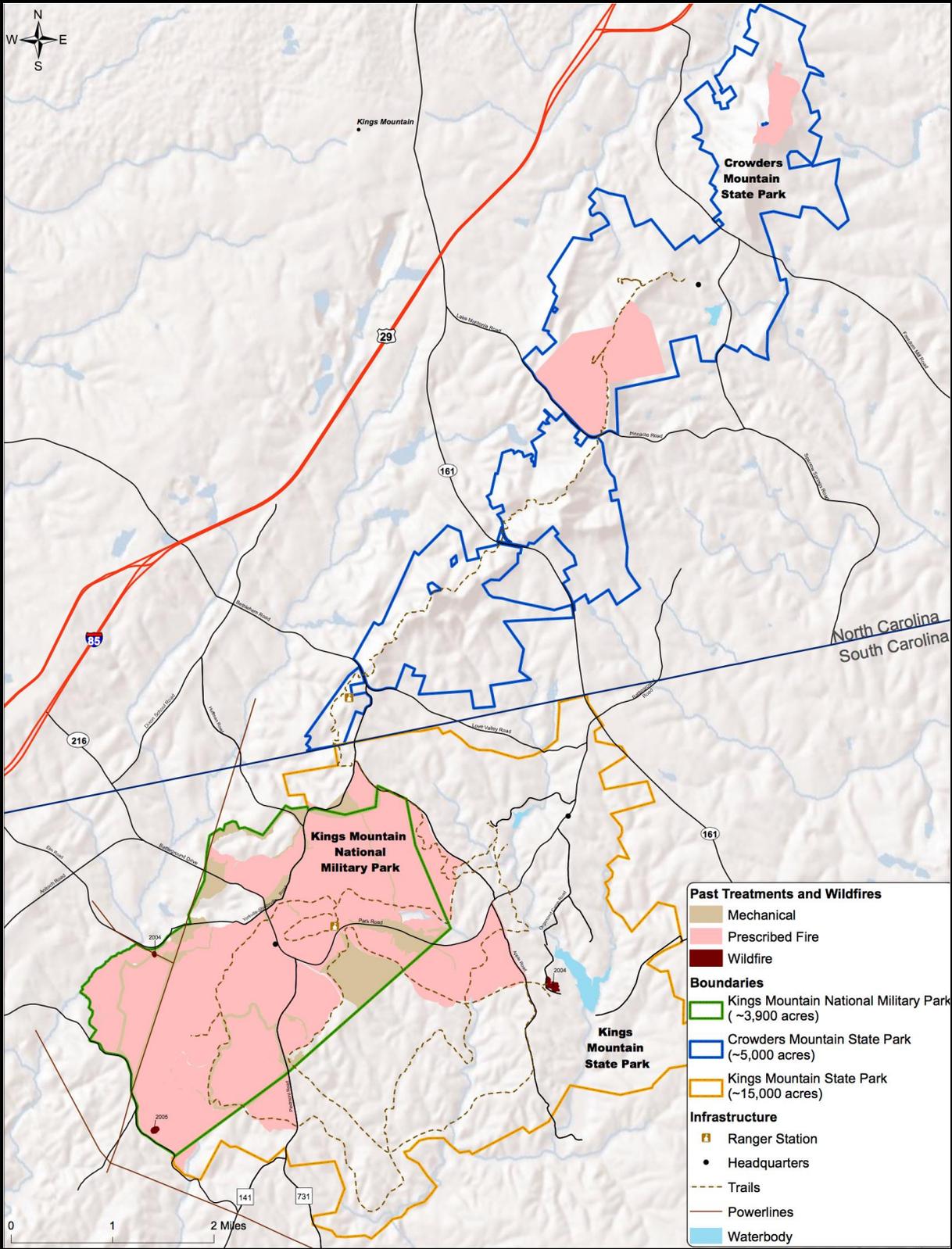


FIGURE 4. PAST TREATMENTS AND WILDFIRES ON THE KINGS MOUNTAIN PARKS

2.2 Alternative A: Continue Current Fire Management at Kings Mountain Parks (No Action Alternative)

This alternative represents what would occur if the KIMO fire management program does not expand its vegetation/fuels management options, and does not develop joint planning and fire management activities with Kings Mountain and Crowders Mountain state parks.

The National Military Park could still rewrite its existing FMP with updated terminology, but fire and vegetation management would be limited to the options approved under the 2000 FMP Environmental Assessment and FONSI (NPS 2000)—prescribed burning, limited mechanical work for defensible space, and wildfire suppression. Park maintenance activities would also allow some minor vegetation management/defensible space work to occur. The National Military Park is allowed to use a masticator under its 2000 FMP EA and FONSI only for defensible space work. The state parks would independently develop their own FMPs specific to their agency requirements.

In summary, under this No Action Alternative the allowed activities would be fire suppression, prescribed burning, mowing of grass areas, infrastructure defensible space work, and spot treatment of invasive, nonnative vegetation by herbicide. There would be no interagency FMP and each park would independently apply its own management direction in implementing these activities.

2.3 Alternative B: Preferred Alternative—Additional Vegetation Management Tools and Wildfire Managed for Resource Objectives (Proposed Action)

Alternative B is the Preferred Alternative and includes all activities allowed under the No Action Alternative, plus it would add managing wildfires for multiple objectives including resource objectives, use of mastication and manual equipment for ecological restoration and defensible space work, and targeted herbicide application by hand-held methods to aid in the above activities. Ecological restoration would be the modification of vegetative fuels to restore native vegetation in structure, composition, and spacing to similar conditions that existed before settlement of the area.

The KIMO, CMSP, and KMSP fire management programs would use the defined fire management techniques as described in a new interagency FMP that would be developed to include all three parks. The synergy of interagency cooperation should help to achieve work that is more effective in the future. All actions would be carefully planned and used to protect and preserve park values, following the FMP goals described in section 1.1. Fuel and vegetation management strategies considered under Alternative B are discussed in detail below.

2.3.1 Mechanical Fuel Treatment

Wheeled or tracked equipment (e.g., mowers, masticators, choppers) could be used for mechanical fuel reduction work focusing on vegetation/fuels management. Mastication could be used to thin dense sapling thickets or pole sized trees; to reduce brush accumulations that have created hazardous ladder fuels; to remove and/or reduce storm damaged or groups of smaller beetle killed trees; and to assist in maintenance and enhancement of cultural landscapes. Mastication would be used to aid in ecological restoration and may be used in conjunction with prescribed fire to help promote more robust growth of grasses and forbs, and more open hardwood forests with additional mature trees.

Mechanical (wheeled or tracked equipment) for fuel reduction and ecological restoration work would be allowed, along with targeted herbicide treatments (see section 2.2.1) used as a follow up to the mechanical work to slow competing vegetation regrowth while native forest and grass/forb species become reestablished. Manual and mechanical fuel reduction in prescribed fire units would help in controlling prescribed burns and in developing the vegetation structure needed for forest restoration. Manual and mechanical work would contribute to safer, more effective defensible space and fuel break work. Manual and mechanical work would

be done for the purposes of hazard fuel reduction, defensible space and fuel breaks, restoring and maintaining cultural landscapes, controlling invasive plant species, and restoring fire-dependent vegetation communities.

Kings Mountain National Military Park plans to treat an average of 100–125 acres per year by mechanical fuel reduction using wheeled or tracked equipment (mastication) as funding allows. Mechanical fuel reduction is necessary in forest restoration to reduce fuel loads and helps restore forest structure toward desired conditions. Typically, mechanical fuel reduction is followed up with prescribed burning. Mechanical treatments decrease fire behavior and intensity in prescribed burns or wildfires, so larger trees (upper canopy) are not burned in the recovering/restored forest.

Kings Mountain State Park has similar large wildfire prevention/forest restoration acreage goals to the National Military Park, but they have less funding availability at this time and it may take additional years to build up to these goals. They are in the earlier stages of developing their fire management program, so have not developed specific mechanical treatment or prescribed fire goals/expectations at this time.

Crowders Mountain State Park would like to accomplish about 1,000 acres of prescribed burning per year. While they want to maintain the option of doing mechanical work, they do not see it as likely in the immediate future of their program.

While the parks have found that some mechanical work may be necessary to assist with forest and ecosystem restoration, all three parks intend to limit the use of wheeled or tracked equipment to minimize impacts on park natural and cultural resources. Many of the ecological issues these parks have inherited come from pre-park logging and intense cutting of vegetation during agricultural settlement, which they want to avoid. All three parks face significant funding constraints in utilizing these techniques to the level needed to fully restore their forests and minimize hazard fuels adjacent to boundaries, infrastructure, and other facilities.

2.3.2 Wildfire Management Strategy

Under this Alternative wildfires may be managed for multiple objectives, including resource objectives. Objectives may change as the fire spreads across the landscape. The goal of wildfires managed for multiple objectives including resource objectives is to use fire as a natural change process to help restore and maintain fire-dependent plant and wildlife communities, to reduce hazard fuels, and to decrease the chance for widespread, uncharacteristically severe wildfires that may impact human and natural values. An example would be a lightning strike ignition, which could be managed to meet resource objectives on one flank and suppressed on another flank where it approaches infrastructure. Managed wildfires are usually ignited by lightning and allowed to burn or managed only by qualified fire management personnel, in certain areas under certain conditions. All three parks would set physical containment limits/boundaries in the parks where each wildfire primarily or partially managed for resource objectives would be stopped. Additional guidance and procedures for implementing these policies would be developed in the interagency FMP.

To be able to use this wildfire management approach, agencies must describe the use and constraints of this strategy in their FMPs. They must provide for firefighter and public safety, address values to be protected, and discuss public health issues. Wildfires managed this way must be consistent with park and resource management objectives, area activities, and follow environmental laws and regulations.

In the National Military Park, if any unplanned ignition is not successfully suppressed upon initial actions, then park managers may consider managing it for multiple objectives, which may include resource objectives. Both state parks would manage or partially manage a wildfire for resource objectives only when the natural ignition is contained in a prescribed fire unit or other defined area that could be used as geographic containment boundaries for the wildfire, and only when approved by their respective state forestry agencies, which have responsibility for wildfire management in both state parks.

Estimating the acres to be burned by wildfires managed or partiality managed for multiple objectives including resource objectives is not feasible due to the uncertainties of ignitions, area of start, constraints on use, weather, staffing, timing, fire behavior and a host of other issues. Lightning caused wildfires managed for

resource objectives may aid in restoring forests and reducing hazard fuels over time, but would not be expected to be a primary restoration technique, as precipitation events are typically associated with lightning in the Kings Mountain area and the constraints described above. In addition, wildfires managed for multiple objectives may change with time. For example, a fire being managed for resource objectives may have those objectives modified to being managed primarily for suppression objectives as it approaches containment boundaries or the vegetation in the area dries out. For purposes of this assessment, all three parks would expect to keep the number of acres burned from wildfires near the average annual estimated prescribed fire acres for their park. If acres were burned through wildfires, the individual parks may reduce their prescribed fire acres for that year.

All techniques described above would be used under carefully prescribed conditions, plans, and objectives to restore, protect, and enhance park values. Management mitigation measures are listed later in this EA to help minimize negative effects on park areas and resources. These mitigations will be carried over into the FMP, depending on the selected alternative. An example, “Fuel reduction activities will be scheduled during the week when possible to limit disturbance to weekend visitors during high visitation periods”. All three parks may describe limits or constraints specific to their park in this EA or in the interagency FMP, dependent on state laws, regulations, and management constraints. Implementation of activities may be limited by available funding.

2.3.3 Herbicide Treatments

This alternative includes the use of limited herbicide application as a management tool, but allows the flexibility to consider and use improved techniques, technology, and newly approved herbicides in the future if more environmentally acceptable alternatives are developed. The use of targeted herbicide application, such as hand application of herbicide to specific basal or foliar plant areas, would minimize chances for overspray. Use of targeted herbicide applications would be considered for brush or small tree reduction in advance or as a follow-up treatment to prescribed burns to aid in forest restoration, to help maintain fuel breaks and/or defensible space work. Targeted herbicide use in conjunction with mechanical or manual vegetation cutting treatments would improve the longevity of the fuel reduction, and help facilitate forest structural restoration of these treatment areas. It could also be used to treat invasive/exotic vegetation as described in Section 2.0.

In the National Military Park, the typical spot herbicide treatment of invasive and woody plants would cover about 5–10 acres per year, but scattered over a 200-acre area. Crowders Mountain State Park is would treat less than 3 acres per year in developed areas to remove invasive, non-native plants. Kings Mountain State Park would treat non-native invasive plants, but has not had the funding to do so.

Being able to more successfully create and maintain fuel breaks and/or defensible space removes a significant fuel hazard risk in prescribed burns and wildfires. This would make prescribed burning safer for employees and nearby residents, aid in the control of wildfires, and provide for safer egress in the event of evacuation. This would also help to return vegetation communities to the range of natural variation where over time prescribed burning and wildfires managed for multiple/resource objectives could be used as the more prevalent natural change and maintenance agent, with less reliance on suppression activities, mechanical and herbicide in the future.

NPS Herbicide Approval and Application Processes

The National Military Park is committed to its role as natural and cultural resource stewards, and is dedicated to protecting the land, waters, wildlife, and people who live nearby, work there and visit. NPS Herbicide application is used by following NPS Management Policy 4.4.5 and 4.4.5.2, and Director's Order 77-7, which outlines the NPS approval process. To get approval, the KIMO Integrated Pest Management Coordinator submits a pesticide use proposal into the NPS Pesticide Use Proposal System. Approval comes only after regional and national level staff consider numerous factors such as the target use, location where the application will occur, potential T&E species concerns, potential for getting into surface or ground water, persistence in the ecosystem, safety to employees and the public, and type of application (example, spot spraying). A product may be approved or not depending on the above factors and alternative treatment possibilities.

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

At the National Military Park, treatments primarily involve low-volume spot treatments of individual invasive non-native plants/trees with a backpack or hand sprayer. These foliar treatments involve spraying herbicide directly onto the leaves of small trees or the target vegetation. The herbicide is applied at a volume that wets the crown/leaves, but minimizes runoff and does not affect non-target species.

2.4 Alternative C: No Wildfires Managed for Resource Objectives

Under this alternative, the KIMO, CMSP, and KMSP fire management programs would be allowed to use all the fuels and vegetation management techniques described above in the Preferred Alternative in a new interagency FMP, except that they would exclude resource objectives as an allowable objective when managing wildfires. Suppression and protection objectives would guide all wildfire responses. These might include safety, cost, smoke, moving onto other jurisdictions, but resource objectives could not be a principle management objective. All fuels and vegetation treatment actions allowed under this alternative (prescribed fire, mastication, and limited herbicide use) would be carefully planned to protect and preserve park values to the maximum extent possible.

2.5 Fire Management Actions and Components Comparison Table

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

TABLE 2. COMPARISON OF FIRE MANAGEMENT ACTIVITIES AND COMPONENTS FOR EACH ALTERNATIVE

Fire Management Activities and Components	Alternative A	Alternative B	Alternative C
	No Action	Preferred Alternative	
Suppression actions would occur in response to wildfires	X	X	X
○ direct and indirect attack, including the use of confine/contain strategies, could be used, depending on safety concerns and cost	X	X	X

Fire Management Activities and Components	Alternative A No Action	Alternative B Preferred Alternative	Alternative C
considerations			
○ aerial retardant and foam could be used with Superintendent’s approval (or state forestry approval for KMSP & CMSP)	X	X	X
○ mechanical equipment could be used to help stop wildfires with Superintendent/Park Manager’s approval (or state forestry approval for KMSP & CMSP)	X	X	X
○ protection of adjacent private property would be considered in all phases of fire management	X	X	X
○ Burned Area Emergency Rehabilitation (BAER) could occur after wildfires in KIMO	X	X	X
Wildfires that may achieve resource objectives could be managed to burn under defined conditions for hazard fuel reduction and ecological restoration goals		X	
Parks would develop an interagency fire management plan to work more efficiently and foster synergy in their fire management programs		X	X
Community cooperation and coordination would occur in the Fire Management Program	X	X	X
Prescribed Burns could be used to achieve identified objectives with approved burn plans	X	X	X
Hand-held mechanical equipment (chainsaws, brush cutters, leaf blowers) could be used during fuel reduction activities	X	X	X
Mechanical fuel reduction using wheeled/tracked equipment could be used for ecological restoration, hazard fuel reduction, and defensible space goals		X	X
Mowers would continue to be used to maintain defensible space around structures, roads, campgrounds and picnic areas, and other park infrastructure	X	X	X
Spot herbicide application may be used to treat invasive non-native(exotic) plants	X	X	X
Spot herbicide application may be used to aid in ecological restoration, hazard fuel reduction, and defensible space activities		X	X
A range of vegetation management techniques (described above) may be used for ecological restoration, historical landscape restoration and maintenance, fuel reduction, fuel break work, and defensible space		X	X

2.6 Mitigation Measures during the Proposed Action

The Kings Mountain Parks would work with resource specialists to ensure cultural and natural resource issues and concerns are considered on planned fire management projects. Resource specialists would also be consulted on emergency incidents, such as wildfires managed for multiple objectives.

Resource Advisors (READs) should be assigned to wildfires of significance to prevent and reduce adverse impacts from fire suppression actions, and to advise in protecting cultural and natural resources. “Wildfires of significance” are usually any fires beyond small, minor low-complexity, short duration initial attack incidents. READs, or resource staff, may also be considered and assigned to prescribed fire and vegetation management projects.

The Superintendents (KIMO, CMSP) or Park Manager (KMSP) have overall responsibility and oversight for all park activities and park staff; he/she sets goals, approves restrictions and closures, coordinates relations with neighbors and partner agencies, and approves the FMP and other major fire documents and plans. In some cases higher-level approval (regional office or state forestry agencies) are considered or required for final approvals.

At the National Military Park, the Chief Ranger, Great Smoky Mountains National Park Fire Management Officer, and Incident Commanders/Burn Bosses assigned by the Superintendent have direct responsibility for public, resident, and staff safety. They would coordinate evacuations and other actions with the appropriate ranger staff, KIMO supervisors, and local emergency management agencies. At the state parks, the responsibility for public, resident, and staff safety is shared with the appropriate state forestry and local law enforcement/emergency management agencies.

The following mitigation measures would help minimize the potential effects of the Kings Mountain Park’s fire management activities on resources, staff, and the public. The following mitigation measures were developed to minimize the degree and/or severity of adverse effects to the resources in the Kings Mountain Parks and would be implemented with the action alternatives, as needed.

General Resource Considerations for Fire Management Activities

- All prescribed burns would have a written and approved prescribed fire burn plan, as required by the *Interagency Prescribed Fire Planning and Implementation Procedures Guide, (April 2014)*. The Guide is interagency policy and is filled with resource, safety, and public mitigation considerations that must be implemented on each prescribed fire project.
- Firefighters would use Minimum Impact Suppression Tactics (MIST) to minimize natural and cultural resource impacts of fire response operations. These tactics would also be used for prescribed fire projects, whenever possible. See page 91, *Incident Response Pocket Guide, January 2014*.
- Natural and manmade features/vegetation change barriers (roads, water bodies, rock outcrops, mowed areas, etc.) would be used for firelines whenever possible to minimize the need for fireline construction. This helps minimize disturbance (e.g., soils, habitat, vegetation) by mechanical equipment or hand line construction. Indirect/confine type strategies would often be the preferred strategy for most wildfires. Parks would identify existing defensible wildfire control lines and allow fires to burn to these control lines or natural features.
- Constructed firelines:
 - Would be built to the minimum depth and width needed for safe control operations.
 - Would be rehabilitated as soon as possible after fires are out, to prevent erosion, negative visual effects, and fewer opportunities for invasive plant establishment.
- Existing roads or fire trails would be used by vehicles and equipment for firefighter travel as much as possible. Use UTVs if possible when off road travel is required, (low impact tires with less ground pressure).

- Reasonable procedures would be followed to prevent unintended spills of foam and fire retardant chemicals. Equipment with fluid leaks would not be used. Refueling, filling or mixing of gas and other fluids would be avoided in the field when possible to prevent spills. When necessary, appropriate precautions would be taken to prevent spills. These actions would be taken away from streams and watercourses.
- After major wildfires in KIMO, Burned Area Emergency Rehabilitation (BAER) would be considered in consultation with regional office and resource specialists. State parks would involve their own state rehabilitation authorities to develop post-wildfire recovery plans.
- Park equipment operators would be trained or advised on how to minimize soil and vegetation disturbance, compaction, and displacement, which helps protect cultural resources, prevents erosion and establishment of invasive plants. Untrained or out of park operators would be accompanied by READs to recommend low-impact operations and techniques.
- At the National Military Park, herbicide would only be used after undergoing the NPS national and regional approval process and considering impacts to natural and cultural resources, and public health and safety. Herbicide would not be used during high winds. EPA instructions would be the primary direction that would be followed when applying herbicide.
- At the state parks, herbicide would only be used after receiving regional approval at the state level.
- Herbicide application:
 - Would occur after developing a treatment plan and herbicide application map for each treatment area. Before application, the public would be notified utilizing signage, bulletin board and/or visitor center notices.
 - Herbicide would not be applied within 3 hours of predicted precipitation or in areas of standing or flowing water.
 - Herbicide would not be used during high winds.
 - EPA instructions would be the primary direction that would be followed when applying herbicide.
 - Herbicide and application devices would be worked on, filled and mixed utilizing approved leak prevention, and catchment systems. These sites should be away from streams or standing water.
 - No visible leakage of chemicals would be allowed from equipment used for transporting, storing, mixing, or applying chemicals.
 - Staff utilizing herbicide would be trained in approved procedures related to proper handling, storage, transportation, mixing, spill prevention, and application procedures.

Air Quality

- Fire/park staff would perform agency, public, and neighbor notification procedures for all prescribed burns, focusing on residents and activities that might be impacted by smoke from the burns.
- Coordination with state air quality/forestry agencies would occur regarding the total number of prescribed burns simultaneously occurring in the area, to limit cumulative smoke impacts.
- Fire staff would coordinate with the Superintendent/Park Manager in advance of prescribed fires to fully consider the effects of smoke on visitation during weekends, holidays or periods of heavy public use.
- When possible, prescribed burns would be conducted when fuel moistures are relatively low to provide better combustion, less residual burning, and more transport and lofting of the smoke column.
- Predicted smoke transport winds would be assessed by prescribed fire managers to determine smoke impacts to sensitive receptors and populated areas.
- Timing and methods of ignition on prescribed burns would be constantly assessed and reviewed by fire managers to minimize smoke impacts.
- Prescribed Fire Burn Bosses used by the parks would be trained in smoke reduction techniques.

- During prescribed burns, smoke monitoring would occur throughout ignition and immediately after; data would be saved as part of the prescribed fire project records.
- On significant wildfires and prescribed burns, incident commanders/burn bosses would work with fire or public information officers to regularly update local residents on expected smoke impacts.

Water Resources

- Water diversion devices and/or brush and duff covering of firelines would be considered on all sloping and bare soil firelines after fire is out to prevent erosion.
- Vegetation and soil duff would be removed, cut or manipulated along firelines to the minimum width and depth necessary for fire control operations, to minimize erosion and soil runoff into streambeds.
- Mop-up on fires would be done utilizing methods to minimize widespread soil disturbance and runoff into streambeds.
- Stream or water crossings by firelines should be avoided where possible to minimize streambed and stream bank disturbance. If necessary, they should be carefully constructed to minimize disturbance to the banks and watercourse area. Crossings should promptly be restored and rehabilitated in consultation with resource specialists.
- Dozer and/or heavy equipment would seldom be used; consider only with consultation of resource specialists and specific permission of KIMO or CMSP Superintendent/KMSP Park Manager. Ensure qualified READs are available to accompany heavy equipment.
- Equipment operation would be avoided on steep slopes, fragile or highly erosive soils, and in or immediately adjacent to watercourses or stream beds.

Vegetation

- Prescribed fire prescriptions would be used that minimize widespread intense and long duration surface burning to prevent reduction of desirable soil species and associations.
- Vegetation and soil duff would be removed, cut or manipulated along firelines to the minimum width and depth necessary for fire control operations to minimize erosion, soil runoff into streambeds and human caused changes in natural vegetation associations.
- Extensive falling and bucking of trees would be avoided along firelines where possible.
- Leftover vegetative fuels cut from firelines would be lop and scattered, or piled for later removal. Cut vegetation would be considered for replacement on firelines after fires are out to block firelines, prevent erosion and promote new growth.
- Constructed firelines would be rehabilitated after fires are out to prevent erosion and promote the re-establishment of native plants.
- Water, pumps, and hose lays would be used for firelines to create wet lines or to back-up smaller firelines where possible to minimize the amount of vegetation cutting and soil disturbance.
- Stream or water crossings by firelines should be avoided where possible to minimize riparian vegetation disturbance. If necessary, they should be carefully constructed to minimize disturbance to the banks and watercourse area. Crossings should promptly be restored and rehabilitated in consultation with resource specialists.
- Mastication should generally be avoided in unique habitat areas where cutting of some vegetation may be undesirable. Treatment/vegetation cutting plan may be more closely analyzed and modified in consultation with resource specialists to meet additional habitat requirements.
- When possible, mowing or mastication should be considered for firelines to avoid exposing mineral soils. Minimizing soil exposure provides fewer opportunities for establishment of new invasive plant species, and easier survival of native plants.
- Slash disposal areas, if needed, would be identified that have no sensitive natural resources or vegetation habitats.

- Prescribed burning prescriptions would be developed that meet specific vegetation management objectives for each prescribed burn unit. Excessive residual burning would be avoided for maximum survival of native seeds and plants. Prescriptions would minimize unplanned mortality of mature trees and keep stand-replacement areas to less than ½ acre in size.
- Fire and resource specialist staffs would design systematic monitoring systems to measure the effects of fire related vegetation management activities, and to determine if treatment objectives are being met.
- Areas disturbed by suppression activities on wildfires, vegetation treatment projects, or firelines for prescribed burns should be monitored for establishment of new invasive plants.
- When possible, incoming vehicles, engines, and equipment from outside the immediate area would be cleaned (including the undercarriage) to remove invasive weed seeds, before use in the parks.
- Fireline berms would be removed, and natural ground contours restored during fireline rehabilitation.
- Equipment operation would be avoided on steep slopes, fragile or highly erosive soils, and in or immediately adjacent to watercourses or streambeds.

Species of Special Concern (plant or animal; state, federal, or proposed)

- Generally, the same mitigations listed below for wildlife would assist with protecting Species of Special concern.
- When sensitive species locations, seasons, unique habitat, nesting areas, or other parameters are involved with a fire management project or wildfire, additional consultation with resource specialists and/or specific wildlife experts would occur. Written directions specifying appropriate and reasonable actions and/or mitigations would then be used in treatment/burn plans or Incident Action Plans to minimize disturbance activities or maximize benefits to those sensitive species.
- After or during the wildfire or other activity, resource specialists would direct formal or informal consultation with the US Fish and Wildlife Service and/or state wildlife agencies on the status of the species, its recovery plan (if any), and previous agreements between the parks and the agencies.
- For the northern long-eared bat, the optional framework to streamline Section 7 consultation would be used by the parks as required to assist with protection of this species and habitat; see (<https://www.fws.gov/midwest/endangered/mammals/nleb/s7.html>).
- The following mitigation measures should apply for the northern long-eared bat:
 - Conduct tree removal activities outside of the northern long-eared bat pup season (June 1 to July 31) and/or the active season (April 1 to October 31). This will minimize impacts to pups at roosts not yet identified.
 - Avoid clearing suitable spring staging and fall swarming habitat within a 5-mile radius of known or assumed northern long-eared bat hibernacula during the staging and swarming seasons (April 1 to May 15 and August 15 to November 14, respectively).
 - Manage forests to ensure a continual supply of snags and other suitable maternity roost trees.
 - For the northern long-eared bat, the optional framework to streamline Section 7 consultation would be used by the parks as required to assist with protection of this species and habitat; see (<https://www.fws.gov/midwest/endangered/mammals/nleb/s7.html>). Accordingly, NPS will make a determination as to whether a specific fire management activity is excepted from incidental taking prohibitions in the final 4(d) rule. At least 30 days in advance of funding, authorizing, or carrying out a specific fire management activity, the NPS will provide written notification of the determination to the USFWS South Carolina Ecological Services Field Office.
 - After providing for public and firefighter safety, attempt to prevent any wildfire from burning to within 0.25 miles of a known hibernaculum
 - After providing for public and firefighter safety, attempt to prevent any wildfire from burning to within 150 feet of a known maternity roost tree, if one is found in the parks

- Contact the appropriate USFWS Ecological Services Office as soon as it is practical to do so in the event of any wildfire that burns within 0.25 miles of a known hibernaculum or 150 feet of a known occupied maternity roost tree, or that occurs during the maternity season (approximately April 1–August 15). Note: This procedure follows the “Emergency Consultation Process” as defined by USFWS.

Wildlife

- Parks will maintain maps and data sources related to unique and important wildlife, their range and habitats in the parks, and species of special concern. This information will help plan avoidance and mitigations during wildfires and vegetation management treatments.
- Upon wildfire notification, resource and/or staff specialists would examine maps and data resources to assess wildlife and important habitat effects. A READ(s) may be assigned to the incident management organization, depending on potential effects, especially if sensitive species are involved.
- When/where possible, use existing roads and fire trails for firelines, and channel travel for fire resources onto routes that are less sensitive to wildlife disturbance.
- Slash disposal areas, if needed, would be identified that are not in sensitive wildlife habitats.
- Mastication and brush cutting equipment use may be curtailed during prime bird nesting season, or other sensitive wildlife activity periods.
- When planning and before initiating non-emergency fuels/vegetation management activities, resource or wildlife specialists would be consulted to determine presence or effects on sensitive species and wildlife. If present, mitigation actions would be developed to minimize impacts on species of concern.
- Chemical retardant, foam, and gasoline refueling would not occur within 200 feet of standing water or streams to protect aquatic species and wildlife.
- Retardant or foam would not be dropped or applied within 300 feet of standing water to protect fish and aquatic species.
- Helicopter bucket filling would only be allowed from approved water sources to help prevent wildlife disturbance.
- Low-level helicopter use would be minimized when possible, and flight levels kept high, in raptor and birding areas, to prevent collisions with aircraft.

Cultural Landscapes (includes cultural and historic sites)

- If fire or fire management activities are to occur in or adjacent to a National Register site or an associated cultural landscape, consult immediately with cultural specialists with knowledge of that site or landscape to ensure that actions are compatible with the broader historic landscape purpose.
- Fire management staffs will have access to maps showing cultural landscapes, so that they know when and where to initiate cultural landscape consultation.
- With cultural landscapes, a wider perspective of any fire management ground or vegetation disturbing actions would be taken, with the goal of enhancing the cultural landscape for the long-term.
- After major wildfires at the National Military Park, BAER activities would be considered in consultation with regional office and resource specialists, and a cultural landscape specialist would likely need included on the BAER team.
- Historic or cultural specialists will be consulted where historic structures are involved in a fire management activity, even if no adjacent formal cultural landscape has been identified.
- Slash disposal areas, if needed, would be identified that have no nearby cultural or historic resources.
- Parks will develop positive relationships with the appropriate State Historic Preservation Office to help identify effects, actions and mitigations on wildfires and fire management activities on park cultural landscapes, and historic and archeological resources. Consultation would occur before prescribed burn or fuel treatment projects to ensure compliance with section 106 of the National

Historic Preservation Act. Identify cultural sites in advance of wildfire, prescribed fire, or fuels treatment activities in order to plan avoidance and mitigation strategies.

- If a wildland fire were likely to spread into an area where historic structures need to be protected, then fire management staff would consult with incident management, resource specialists, and facility management staff to immediately develop a structure protection plan that best protects the historic materials present, (for instance, water can be very damaging to some structures).
- Educate assigned fire personnel about the significance of cultural sites, how to identify and avoid those sites, and appropriate actions and notifications to be made if new sites are encountered. Remind assigned firefighters to never pick up or disturb artifacts or cultural resources, but to report and document their presence.
- Avoid building firelines and doing any ground disturbance in major historic/cultural site areas.
- Use defensive and point protection tactics, and indirect attack tactics, in collaborating with cultural specialists, to prevent damage to historic/cultural values.
- When work must occur in cultural/historic areas, mowing or mastication would be considered for firelines to avoid exposing mineral soils and buried cultural materials.
- Flush cut stumps in cultural sites rather than remove them. Avoid ground disturbance as much as possible in and around cultural sites.
- If the KIMO or CMSP Superintendent/KMSP Park Manager approves the use of heavy equipment, accompaniment by READs with a historic/cultural background would help ensure avoidance of archeological/cultural sites.

Visitor Use and Experience

- Repeatedly emphasize the safety of fire staff, neighbors, and the public as the highest priority in all fire management activities.
- Park neighbors and visitors would be notified of all fire management activities (wildfires, prescribed burns, vegetation treatments) that have the potential to impact them. Superintendent/Park Manager would assure that appropriate level/intensity of public information is present during projects or wildfires.
- Parks will develop procedures for visitor evacuations during wildfires; reference to these procedures will be made in the FMP.
- Herbicide would only be used after visitors were out of the immediate area, or informed in advance, and appropriate informational signing was placed at human entries to a spray area.
- Emphasize rehabilitation of constructed firelines in public areas after fires are out to prevent visual effects.
- For wildfires, regular media releases would inform locals and visitors about the expected impacts of the fire, especially related to smoke, and closures or restrictions. Signs or notices may be posted at appropriate places to inform incoming visitors of the fire situation.
- As burned areas are opened to visitors after a fire, signs would be posted informing of potential hazards in the burned areas, (snags, stump holes, etc.). Informational/interpretive signing and notices related to fire's ecosystem effects/benefits would also be considered.
- To prevent accidental exposure to hazards, neighbors and visitors would be kept out of the immediate vicinity of fire management activities such as mastication, tree falling, low-level aviation operations, prescribed fire, and equipment use. The Superintendent/Park Manager may authorize temporary closure/restrictions in some areas to protect visitors and neighbors. These actions will be coordinated with the appropriate state forestry agency.
- Parks would monitor fuel, weather, and fire condition parameters and may limit public access and activities when extreme conditions develop, as designated in Preparedness Level planning, included in their FMP(s).

- Initial attack staff would determine the proximity of a new fire to visitors, adjacent landowners, and communities. They would coordinate with rangers and local agencies to inform them of the potential hazards and evacuate as necessary.
- Defensible space planning and hazard fuel reduction would be an ongoing and continuous activity for park buildings and infrastructure. Block cutting and abrupt (straight) edges to cut areas would be avoided to create better visual integration with adjacent vegetation.
- Prescribed fire burn boss would work with local residents in close proximity to prescribed burns to address their concerns during planning and implementation.
- Education programs on fire ecology will be incorporated into park interpretive and education programs.

Agency Plans and Policies

- Develop interagency FMP and coordination processes to more effectively implement fire management actions between the three Kings Mountain Parks.
- Consider other local and state fire protection agencies responsibilities and authorities when writing and revising Fire Management Plan(s).
- Continually emphasize the safety of fire and park staff, neighbors, and the public as the highest priority in all fire management activities.
- All fire management activities, including wildfires, would fully consider risk and effects to private property adjacent to the parks. This consideration would occur on an ongoing basis.

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

TABLE 3. SUMMARY OF ALTERNATIVES AND HOW EACH ALTERNATIVE MEETS PROJECT OBJECTIVES

Objectives	A: No Action Alternative Continue Current Fire Management at Kings Mountain Parks	B: Preferred Alternative Additional Vegetation Management Tools and Wildfire Managed for Resource Objectives	Alternative C No Wildfires Managed for Resource Objectives
Firefighter and public safety is the top priority	No, continued retention and buildup of hazard fuels would increase risk of larger and/or intense wildfires; the lack of efficient fuel breaks would reduce ability of fire fighters to control wildfires. Minimal defensible space could lead to increased threat to structures and humans. All this could contribute to less effective suppression that could expose fire fighters and the public to elevated risk.	Yes, ability to use additional fire management tools would decrease hazard fuels, increase number and quality of effective fuel breaks to enhance point protection abilities, and decrease probability of large and intense fires over time. This would increase the likelihood of fire fighters to control wildland fires safely and decrease health and safety risks for visitors and park employees.	No, the ability to use additional fire management tools in the parks would allow flexibility in ensuring firefighter and public safety in those areas. The inability to manage wildfires for resource objectives would likely lead to retention and buildup of hazard fuels, which could result in localized, severe and intense wildfires. These issues would likely lead to increased health and safety risks for firefighters, visitors, and park employees.
Protect NPS, state and private infrastructure, facilities and property	No, the lack of using mechanical treatments and inability to manage wildfires for multiple objectives including resource objectives would over time lead to fewer acres treated, which would result in continued retention and buildup of hazard fuels throughout the parks. Increased hazard fuels would result in localized, large and intense wildfires that would pose elevated risk to NPS, state, and private infrastructure, facilities, and property. The lack of mechanical fuel reduction to create efficient fuel breaks and defensible space would reduce the ability of firefighters to do point protection of infrastructure, facilities, and properties.	Yes, use of additional fire management tools would increase the amount of treated acres and help reduce hazard fuels and to create additional fuel breaks and defensible space, which would help to better protect federal, state, and private infrastructure, facilities, and property. The Kings Mountain Parks would decrease the potential for severe and intense wildfires that pose risk to infrastructure, facilities, and adjacent properties.	No, similar to the Preferred Alternative, however the inability to use wildfires to meet resource objectives would lead to fewer acres treated over time, making reduction of hazard fuels less effective in the parks. This could lead to increased fire risk for some areas that would pose elevated risk to park infrastructure, facilities, and properties.

Objectives	A: No Action Alternative Continue Current Fire Management at Kings Mountain Parks	B: Preferred Alternative Additional Vegetation Management Tools and Wildfire Managed for Resource Objectives	Alternative C No Wildfires Managed for Resource Objectives
Manage and maintain historic, cultural, recreational, and aesthetic landscapes	No, the lack of mechanical treatments and wildfires managed for multiple objectives including resource objectives would likely lead to the continued buildup and retention of hazard fuels. Increased hazard fuels could lead to intense and severe wildfires that would threaten historic, cultural, recreational, and aesthetic landscapes. The lack of mechanical equipment for hazard fuel reduction and defensible space could also limit the protection of historic, cultural, recreational, and visual landscapes.	Yes, this alternative considers fire management tools for vegetation restoration and hazard fuel reduction, which would enhance the maintenance and/or restoration of historic, cultural, recreational, and aesthetic landscapes and restoring fire as natural ecological processes. Mechanical treatments and managing wildfires for multiple objectives including resource objectives would further reduce hazard fuels, which would reduce severe fire risks to historic, cultural, recreational, and aesthetic landscapes over time. Mechanical treatments followed by targeted herbicide could be used for a full variety of reasons to protect cultural and visitor use and experience resources.	No, similar to the Preferred Alternative, however the inability to use wildfires to meet resource objectives would make reduction of hazard fuels less effective in the parks. This could increase the risk of severe and intense wildfires for some areas, which would not promote restoration, or maintenance of historic, cultural, recreational, and aesthetic landscapes.
Restore and protect natural and ecological values	No, the inability to use mechanical treatments and wildfires managed for multiple objectives including resource objectives would lead to increased hazard fuels, and severe and intense wildfires, which could threaten natural and ecological resources. The increased hazard fuels could limit the protection and restoration of natural and ecological resources.	Yes, this alternative considers fire management tools for vegetation restoration and hazard fuel reduction, which would enhance the protection of natural and ecological resources. Managing wildfires for multiple objectives including resource objectives and mechanical treatments would help reduce hazard fuels over larger areas, and do it with appropriate timing for fire dependent communities, which would reduce	No, the inability to manage wildfires for multiple objectives including resource objectives would lead to increased hazard fuels in some areas, which could lead to localized, severe and intense wildfires over time, which would threaten natural and ecological resources at the parks. Out-of-season timing of prescribed burns may hinder recovery and restoration of fire dependent habitat communities, which would

Objectives	A: No Action Alternative Continue Current Fire Management at Kings Mountain Parks	B: Preferred Alternative Additional Vegetation Management Tools and Wildfire Managed for Resource Objectives	Alternative C No Wildfires Managed for Resource Objectives
		the risk to natural and ecological resources over time.	threaten natural system values.
Minimize high severity and human caused/unwanted wildfire	No, hazard fuels would likely continue to be retained and accumulate in some areas. Increased hazard fuels would lead to severe and intense wildfires.	Yes, this alternative would allow wildfires managed for multiple objectives including resource objectives and the mechanical treatments to reduce hazard fuels, which would treat more acres and minimize the potential for severe and intense wildfires. Mechanical treatments used to create defensible space and fuel breaks with targeted herbicide as a follow up maintenance treatment would also minimize the potential for severe and intense wildfires.	No, similar to the Preferred Alternative, however the inability to use wildfires to meet resource objectives could lead to increased hazard fuels in some areas. Increased hazard fuels in some areas could lead to localized, severe and intense wildfires.
Promote communication and cooperation on fire management activities between agencies and the public	Yes, cooperation and coordination would occur with community and area residents would continue. In addition, interagency fire management efforts between the Kings Mountain Parks and cooperation with neighbor and partner agencies would continue.	Same as the No Action Alternative	Same as the No Action Alternative
Does the alternative meet project objectives?	No, because less hazard fuel reduction and reduced acreage of natural and cultural landscape restoration would occur	Yes, this alternative would provide the maximum opportunities for the hazard fuel reduction and natural and cultural landscape restoration	No, this alternative provides more hazard fuel reduction and natural and cultural landscape restoration than the no action alternative, but less than the preferred alternative

TABLE 4. COMPARISON OF PROPOSED FIRE MANAGEMENT COMPONENTS BY ALTERNATIVES

Components	Alternative A No Action Alternative	Alternative B Preferred Alternative	Alternative C
Prescribed Burning	Prescribed burns would be used as a fire management tool. However, hazard fuels would continue to be retained and to build, increasing the potential intensity and difficulty to control/suppress future wildfires. The three parks' ecosystems resilience to hurricanes, drought, pest outbreaks, and wildfire would continue to decrease.	Prescribed burns would be used to reduce hazard fuels and to restore fire to fire-adapted ecosystems. Implementing prescribed fire would be a priority in restoring and protecting ecosystems and unique habitats (e.g., wetlands, pine savannas). Prescribed burning would become safer and more effective as understory and mid-story brush is reduced. Fuel breaks and defensible space could be created and maintained by mechanical treatments and targeted herbicide application, decreasing risks associated with prescribed burns and facilitating the management of wildfires.	Same as the Preferred Alternative, however, not allowing for the management of wildfires would likely not reduce hazard fuels to the level of the Preferred Alternative.
Wildfire Managed for Multiple Objectives including Resource Objectives	All wildfires within the parks' boundaries would be suppressed, so restoration of natural ecological processes and habitat and hazard fuel reduction would be less. Because of the buildup of hazard fuels, over time wildfires would be more likely to be high severity/stand replacement type fires.	Wildfires would be allowed to burn with multiple objectives to accomplish specific resource management objectives. The use of wildfire for multiple objectives including resource objectives would be one more "natural method" to reduce hazard fuels and restore habitat.	Same as the No Action Alternative, however, utilizing other vegetation control measures within the parks' may reduce the likelihood of high severity/stand replacement type fires, but still less so compared to the Preferred Alternative.
Fire Suppression Tactics	All wildfires within park boundaries would be suppressed, utilizing both direct and indirect tactics, depending on each fire situation. Fire control actions in certain areas would be more challenging due to less reduction of understory and mid-story brush.	Same as No Action Alternative, except that fire control actions may be more successful with more allowed reduction/restoration of vegetation due to utilization of more active vegetation management tools, (e.g., prescribed fire, mechanical treatment, limited herbicide use)	Similar to the Preferred Alternative, although less wildfire for resource objectives would increase hazard fuels over time and may result in less wildfire control success and higher intensity fires than the preferred alternative
Mechanical and	Mechanical treatments using wheeled or tracked	Mechanical and manual treatments would be used to	Same as the Preferred

Components	Alternative A No Action Alternative	Alternative B Preferred Alternative	Alternative C
<p>Manual (Mechanical includes wheeled and tracked equipment, such as grinders, bush hog, and masticators and handheld motorized equipment such as weed eaters, chainsaws, hand-held brush cutters, leaf blowers)</p> <p>(Manual includes hand tools; ax, pulaski, cross-cut saw, pruners, shovel)</p>	<p>equipment would not be used to reduce hazard fuels, prep units for prescribed burning, or to assist on ecological restoration goals within each park. Hazard fuels would continue to be retained and to build up in density over time, increasing the potential intensity and difficulty to control/suppress future wildfires. Fire control actions in certain areas would be more challenging due to less reduction of understory and mid-story brush.</p>	<p>reduce hazard fuel in WUI zones, prep units for prescribed burning, to reduce the vegetation and hazard fuels along park roads/trails, or to accelerate ecological restoration goals within each park. Focused treatment may occur near developments, cultural, natural, and other resources. Each park would plan in advance and ensure protection of natural and cultural resources.</p>	<p>Alternative</p>
<p>Herbicide Treatments</p>	<p>Chemical treatments would not be used as a fuel management tool, so fuel reduction acreage associated with fuel breaks would be less.</p>	<p>Targeted herbicide treatments used as a follow-up treatment may be used, following each parks' approval processes, to help maintain fuel breaks, initial restoration work, and defensible space to aid in understory and/or mid-story brush along fuel breaks. Treated fuel breaks would be more effective combined with mechanical work.</p>	<p>Same as the Preferred Alternative</p>

CHAPTER 3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Methodology

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

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

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

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

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

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

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

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

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

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

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

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

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

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

3.2 Climate Change

Climate change is affecting forest structure, composition, function, and ecosystem processes in the eastern United States. Increased temperatures, pollution, non-native insect pests, disease, and invasive plants are all contributing to altering ecosystem processes and forest structure and composition (Grimm et al. 2013, NPS 2014a). A recent analysis at the National Military Park and surrounding lands (i.e., areas within 19 miles of the boundary) shows climatic conditions are already shifting beyond the historical range of variability (NPS 2014a). Climate change is affecting management of natural and cultural resources and visitor experience

(NPS 2014a). However, based on the current information available for climate change and associated vegetation changes, and the complex and uncertain interactions between climate change, non-native biotic stressors, and vegetation, the climate change models predict how park resources may change based on the predicted change of temperature and precipitation in the future compared to the baseline conditions. For example, changes in forest structure, composition, and function could affect habitat suitability, degrading or eliminating habitat for some species in the National Military Park and surrounding CMSP and KMSP managed lands.

There are potential future changes in plant communities from predicted climate change, as individual plant species respond to large and small-scale changes in temperature and precipitation, fertilizing effect of increased carbon dioxide, and changing patterns of inter-specific competition (Shafer et al. 2001). The spread of non-native plant species could be accelerated in response to future climate changes, particularly in those areas where native plant species are unable to adapt to the climate changes (DeVivo et al. 2008). In the National Military Park, potential forest change in tree species was projected to be 56–66% by 2100 with a 45–58% uncertainty in forest change projections (Fisichelli et al. 2014). Habitat suitability for some individual tree species in the National Military Park had mixed results from no change to large decrease or no change to small increase depending on the greenhouse gas emissions scenario (Fisichelli et al. 2014).

Currently, climate change models are not sufficiently precise to address increases in temperature and precipitation over the short duration of the planning period for the FMP and the small scale of the Kings Mountain Parks. Therefore, the potential impacts of climate change on resources of the Kings Mountain Parks is not analyzed in detail under the environmental consequences section for each impact topic because of the uncertainty and variability of the predicted outcomes. Furthermore, impacts would not differ between the alternatives. However, alternatives that improve natural resources resiliency to climate change (i.e., hazardous fuel reduction and vegetation management) would be expected to provide greater beneficial impacts and ecosystem adaptability than alternatives that improve natural resources to a lesser degree.

3.3 Cumulative Impacts

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

Cumulative impacts were determined by combining the impacts of the proposed project alternative with other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other ongoing or reasonably foreseeable future projects in the Kings Mountain and Crowders Mountain State Park area and, if applicable, the surrounding region. The temporal scope includes projects within a range of approximately 10 years.

3.4 Air Quality

The Clean Air Act of 1963 (42 U.S.C. 7401 *et seq.*) established federal programs that provide special protection for air resources and air quality related values associated with NPS units. Specifically, Section 118 of the Clean Air Act requires a national park system unit to meet all federal, state, and local air pollution standards. In addition, the Clean Air Act gives the federal land manager the responsibility to protect air quality related values (i.e., visibility, plants, animals, soils, water quality, cultural resources, and visitor health) from adverse pollution impacts.

3.4.1 Affected Environment

National Ambient Air Quality Standards (NAAQS) for criteria pollutants are intended to protect human health and welfare. Criterion pollutants are sulfur dioxide (SO₂), nitrogen oxide (NO_x), ozone (O₃), particulate matter (PM₁₀ and PM_{2.5}), lead (Pb), and carbon monoxide (CO). Kings Mountain Parks are classified as Class II areas under the 1977 amendments to the Clean Air Act. Class II areas are allowed modest increases in air pollution beyond baseline levels for particulate matter, sulfur dioxide, nitrogen and nitrogen dioxide, if the national ambient air quality standards, established by the EPA, are not exceeded.

Ambient monitoring for SO₂, NO_x, O₃, and PM has not been routinely conducted for the Kings Mountain Parks, but modeling efforts and estimates generated by NPS and based on regional air quality sites indicate that the National Military Park is in compliance with the NAAQS (NPS 2009). Both state aprks are also in compliance with the NAAQS (EPA 2015).

Prior to any prescribed fire, the Kings Mountain Parks would notify the North Carolina Forest Service, South Carolina Forestry Commission, South Carolina Interagency Coordination Center, local fire departments, neighboring land owners, and park staff at a minimum. The notification would identify the location and size of the proposed prescribed fire, as well as the fuel types to be burned.

There would be no prior notification when an unplanned ignition creates a wildfire; the wildfire would be managed for multiple objectives including resource objectives. However, the air quality situation would be considered in deciding which tactics to utilize in managing the fire. If the air quality (smoke) from other wildfires or prescribed burns was dominant in the area, and significant air quality exceedances occur or are projected, then the NC Forest Service or SC Forest Commission would likely recommend actions to suppress the fire as soon as safely possible.

3.4.2 Methodology and Intensity Threshold

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

Intensity:

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

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

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

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

Duration:

Short-term: Recovers in 7 days or less.

Long-term: Takes more than 7 days to recover.

3.4.3 Environmental Consequences

Alternative A—No Action

Each prescribed burn plan would include expected smoke trajectory planning 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 prescribed burn plan. Arrangements would be made prior to ignition to ensure that designated fire resources are available if needed. Prescribed fires would not be implemented when atmospheric conditions exist that could permit degradation of air quality to a degree that negatively affects public health for an extended period (federal and state air quality standards will be the basis for this decision).

Prescribed fire smoke situations that arise and threatens smoke-sensitive areas in a substantial way may trigger suppression and/or mitigation measures that terminate the prescribed burn. Mitigation measures would include burning during appropriate weather and fuel moisture conditions (e.g., prescription windows) where fuels are dry and will be more completely consumed, thus minimizing smoldering; utilizing wind conditions that disperse smoke away from communities; and accelerated mop-up where possible to minimize smoldering. Burning under appropriate conditions could take advantage of favorable air column lift and smoke transport conditions, dispersing smoke more quickly.

Wildfires are unplanned events, and may not occur during favorable weather or meteorological conditions that would allow for dispersion and transport away from sensitive receptors (i.e., local communities, private residents). Unplanned wildfires could affect air quality and visibility in the Kings Mountain Parks and surrounding areas, depending on the fire location, size, and wind direction. The effects of wildfire managed with aggressive suppression strategies would be localized, short- to long-term, and negligible to minor. Adverse impacts could increase to moderate depending on the direction of the winds and the size of the wildfire.

Impacts to air quality from particulate matter (ash) and smoke produced from wildfires and prescribed fires would be direct, adverse, minor, short-term, and localized. There may be an intermittent and short-term exceedance of air quality standards (especially particulates) resulting in short-term, localized, and negligible to minor adverse impacts to air quality and visibility. Smoke/air emissions would include reduced visibility along park and area roadways, reductions in recreation values due to visibility limitations and temporary irritation by smoke and odors, and possible health effects to sensitive receptors, such as neighboring residents and visitors. These adverse indirect effects would be short-term, localized, and minor. The amount and duration of these smoke impacts should be minimized for prescribed fires by limiting the acres burned at one time and timing ignitions early in the day to allow for combustion that is more complete during daytime conditions. Wildfire response would also be coordinated with regional fire managers to minimize impacts to air quality. Overall, fire management activities would reduce the potential for future intense or severe wildfires, which could deposit large particulate matter loads into the air, resulting in long-term beneficial impact to air quality.

Air pollutants and dust would be generated by use of gasoline-powered equipment for wildfire suppression activities, such as building firelines, and increased vehicle traffic associated with fire crews. The direct adverse effect of these pollutants on air quality would be localized, short-term, and minor.

Under this alternative, the number of acres successfully restored in fire adapted forests and vegetation communities would be reduced. Areas would continue to increase in hazard fuel loadings—dense brush, small tree understory, and dead and down forest debris—, resulting in increased potential for localized, intense severe wildfires that would be more difficult to suppress/control. The increased potential for uncharacteristic wildfires difficult to control and the likely increased hazard fuel loadings could increase the smoke and visibility impacts.

The No Action Alternative could result in adverse, minor to moderate, localized, short- to long-term impacts due to increased potential for locally severe fire effects on air quality.

Cumulative Impacts

Activities that could contribute to air quality impacts include routine maintenance of park and local roads; wildfires, pile burning, and prescribed burns by regional entities outside the parks; forestry and manufacturing product plants North and South Carolina; and traffic on Interstate 85. These activities could result in minor to moderate, adverse impacts on the regional airshed due to particulate matter from wildfires and prescribed fires and emissions from vehicles and local commercial enterprises.

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

Alternative B—Preferred Alternative

Similar to the No Action Alternative, air quality affected by management operational responses to wildfires would be the same, emissions of air pollutants from the operations of vehicles and dust generated from suppression activities.

The effects of wildfire and prescribed fire to air quality would be the same as described for the No Action Alternative with adverse, short- to long-term, minor to moderate impacts depending on the fire conditions (e.g., location, size, and wind direction). Under the Preferred Alternative, wildfires managed for multiple objectives including resource objectives would be allowed. Wildfires managed for multiple objectives including resource objectives could cover a larger area, which would further reduce hazard fuels, decreasing the potential for future intense and severe unplanned wildfires. The reduction of intense, severe wildfires would reduce emissions and associated fire effects to air quality, resulting in long-term, local, minor to moderate, beneficial effects.

The impacts of managing wildfires for multiple objectives including resource objectives would depend on the fire location, size, spread, vegetation type present and time (years) since last fire, and other factors. Because of the small size of the Kings Mountain Parks, management of wildfires for multiple objectives including resource objectives or partially managed for resource objectives would still require appropriate control actions. In most cases, there would be confinement boundaries established to eventually stop fire spread. Management of wildfires would include the full range of strategic and tactical objectives, although the small size of the parks and the desire to keep fires in local burn blocks would place limits on the range and duration of these fires. Additional actions may include keeping the fire out of heavy fuels if it would produce too much smoke, keeping it away from sensitive natural or cultural resources, keeping it from burning private property, or suppressing one flank of the fire while allowing another to continue to burn under certain conditions, etc. This type of management reduces hazard fuels and would likely result over time in less intense wildfires that are easier to manage/suppress with lower overall smoke emissions and visibility impacts. The use of wildfire to benefit resources would accomplish specific resource management objectives through processes outlined in the FMP.

Air pollutants generated from use of internal combustion powered equipment in mechanical fuel reduction projects would temporarily affect air quality. The increase of gasoline emissions in the treatment areas would have a negligible contribution to increased air pollutants in the area. The adverse effects on air quality, given the small size of the projects and infrequency of activity, are expected to be localized temporary, and negligible to minor. Wildfires managed for multiple objectives including resource objectives would be unlikely to generate fugitive dust related to fireline construction, as existing roads, trails, and natural boundaries would serve as firelines reducing the need for fireline construction.

Targeted herbicide application, such as foliar application, could result in herbicide temporarily in the air in the immediate vicinity of the treatment area due to spray drift and volatilization (evaporation of liquid to gas). However, mitigation measures (Section 2.6) and the minimal use of herbicide would reduce the potential for drift into non-target areas, and the amount of herbicide released into the air through volatilization. Airborne herbicide risks have been shown to be insignificant, even when prescribed fires are applied immediately after herbicide application (McMahon and Bush 1991). The indirect and longer-term adverse impacts would be negligible.

The Preferred Alternative could potentially produce slightly lower smoke emissions over time by effectively reducing brush and tree understory, and forest debris, changing the main fire carrier fuel to grass and forbs in some areas, a faster burning fuel, which creates less smoke. Overall, this alternative would likely lead to lower and less intense wildfire emissions over time, which would have a beneficial local effect.

Cumulative Impacts

Activities that could contribute to air quality impacts include routine maintenance of park and local roads; wildfires, pile burning, and prescribed burns by regional entities outside the parks; forestry and manufacturing product plants North and South Carolina; and traffic on Interstate 95. These activities could result in minor to moderate, adverse impacts on the regional air-shed.

The Preferred Alternative in combination with the past, present, and foreseeable future actions would result in minor to moderate, short-term, adverse, localized cumulative impacts to air quality due to the decreased potential for severe and intense wildfires, which leads to reduced particulate matter emissions. Contribution to cumulative air quality impacts resulting from the Preferred Alternative would be negligible, as most air quality impacts are from other sources.

Alternative C—No Wildfires Managed for Resource Objectives

Air quality impacts under this alternative would be the same as the Preferred Alternative; however, there would be no utilization of wildfires managed for multiple objectives including resource objectives. This would result in less reduction of hazard fuels compared to the Preferred Alternative and increase the probability of high severity wildfires, thus more intense wildfire emissions over time. This would result in direct, short-to long-term, localized, and minor to moderate adverse impacts.

Cumulative Impacts

Activities that could contribute to air quality impacts include routine maintenance of park and local roads; wildfires, pile burning, and prescribed burns by regional entities outside the parks; forestry and manufacturing product plants North and South Carolina; and traffic on Interstate 95. These activities could result in minor to moderate, adverse impacts on the regional air-shed. Alternative C in combination with the past, present, and foreseeable future actions would result in minor to moderate, short-term, adverse, localized cumulative impacts to air quality. Contribution to cumulative air quality impacts resulting from Alternative C would be negligible, as most air quality impacts are from other sources.

3.5 Water Resources

The Clean Water Act establishes the basic structure for regulating discharges of pollutants into the waters of the United States and for regulating water quality standards for surface waters. The purpose of the Clean Water Act is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." National Park Service's *2006 Management Policies* require protection of water quality consistent with the Clean Water Act, and state that NPS will perpetuate surface waters and ground waters as integral components of park aquatic and terrestrial ecosystems.

There are no marine or estuarine resources within the project areas; however, there are surface waters.

3.5.1 Affected Environment

The three parks are located within the 24,868-mi² Santee River Basin and Coastal Drainage, a U.S. Geological Survey National Water-Quality Assessment (NAWQA) study basin and they include a variety of surface water resources, from floodplain habitat to mountain seeps and streams.

The northwest portion of the National Military Park drains into Kings Creek. Dellingham Branch and Stonehouse Branch convey water toward the northwest into Kings Creek, which defines the park boundary in that area. The Long Branch drainage receives input for the eastern half of the National Military Park and conveys water toward the southeast out of the park. The Garner Branch drainage receives input from the southwest sector of the park and conveys water toward the southwest and eventually into Kings Creek south of the park. All of these streams are part of the Broad River drainage.

The natural riparian areas along the streams in and around the Kings Mountains Parks contain diverse, dynamic, and complex biophysical habitats. These riparian areas are known to be important in controlling the physical and chemical environment of streams and in providing detritus and woody debris for streams and near-shore areas of water bodies. For example, riparian forests of mature trees (30–75 years old) are known to reduce delivery of nonpoint source pollution to streams and lakes (Lowrance et al. 1985). Riparian vegetation has well-known beneficial effects on bank stability, biological diversity and water temperatures of streams (Karr and Schlosser 1978). These interfaces between terrestrial and freshwater ecosystems are very sensitive to environmental change (Naiman and Décamps 1997). Defining and ultimately managing riparian habitat is important to the preservation of the Kings Mountain Parks' natural resources (Weeks 2002).

Crowders Mountain State Park has low elevation seep community types. This wetland community type occurs as a seepage or spring at the bases of slopes or the edges of floodplains in the Piedmont and lower mountains. These areas tend to be small and saturated and are often shaded by the canopies of neighboring forest communities. Seeps are believed to be stable over long periods but respond to changes in groundwater levels resulting from drought. They contrast sharply with the surrounding landscape, have distinct species assemblages, and are repeated across the landscape. Trees are uncommon and are usually wetland species such as red maple or willow oak (*Q. phellos*) that occur at the site's margins. Shrubs species can include spice bush (*Lindera benzoin*), wild raisin (*Viburnum nudum*), blueberries, and tag alder (*Alnus serrulata*). A wide variety of wetland herbs can occur, including cinnamon fern (*Osmunda cinnamomea*), royal fern (*O. regalis*), New York fern (*Thelypteris noveboracensis*), and southern lady fern (*Athyrium asplenoides*). Four locations of low elevation seep communities have been documented in the southern portion of the park in ravines on both sides of the Kings Mountain ridge (CMSP 2010).

The water bodies within Kings Mountain State Park include numerous gravel and silt bottom streams located throughout the rolling terrain. The drainage system includes Kings Creek, Clarks Creek, Clarks Ford, Longs Creek and Bullocks Creek that all form part of the Broad River drainage system (KMSP 2014).

Wetlands

Seventy-four wetlands totaling 4.25 acres were located within the National Military Park boundaries (Morgan et al. 2003). The average wetland size was approximately 0.06 acres with the largest being approximately 0.34 acres and the smallest approximately 0.004 acres. Most supported both woody and herbaceous vegetation. Common species included red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), American hornbeam (*Carpinus caroliniana*), spicebush (*Lindera benzoin*), blueberry (*Vaccinium* spp.), azalea (*Rhododendron* spp.), and various sedges, and ferns. Wetlands were found throughout the National Military Park and occurred in a variety of landscape positions (e.g., from floodplains of streams to discharge points on steep slopes). Most were associated with stream drainages. The primary type of hydrology, even in those adjacent to streams, was groundwater discharge; overbank flooding did not appear to be the primary source of hydrology for any wetland at the National Military Park.

At the National Military Park, utilizing the Cowardin* system, forty-six wetlands were classified as palustrine, forested, and deciduous (PFO1) with varying hydrologic regimes. Forty-two wetlands were considered temporarily flooded (PFO1A) and four was considered seasonally flooded (PFO1C). Twenty-six wetlands were considered palustrine scrub-shrub (PSS). Of these, 22 were considered to be temporarily flooded and dominated by deciduous vegetation (PSS1A), while one was considered to be seasonally flooded (PSS1C). The remaining three PSS wetlands were temporarily flooded and dominated by evergreen vegetation (PSS3A). One wetland was considered a palustrine emergent system that was temporarily flooded (PEM1A). The remaining wetland was considered a riverine system that is intermittently flooded within a streambed dominated by rubble (R4SB2) (Morgan et al. 2003).

The primary functions performed by wetlands at the National Military Park were to maintain base flow and export carbon and nutrients to streams and rivers. These processes are critical for maintaining water levels and food webs necessary to support vertebrate and invertebrate organisms associated with such systems. Several wetlands ponded water long enough to be used by amphibians for breeding (Morgan et al. 2003); adult amphibians or their egg masses were observed at these wetlands during field sampling. No threatened or endangered animals or plants were found, but several wetlands did support populations of obligate plant species that are seldom found in other habitats (Morgan et al. 2003).

In landscapes where surface water is not plentiful, small wetlands and headwater streams are the only habitats suitable for many such species. Some wetlands at the National Military Park had the potential to store surface water; but overall, the attenuation of floods was not considered a major function. None of the wetlands had the capability to store enough water to reduce downstream flooding; and at the National Military Park (as in most landscapes), it is the cumulative storage that is significant. Several wetlands were at sites of historical occupation/use and have cultural significance (Morgan et al. 2003). Several of the wetlands have potential as research areas and as reference sites. The original forest community at the National Military Park has been altered and as such, none of the sites are “pristine.” The hydrology and soils of most however, have not been altered substantially; thus, they are examples of wetlands in generally good condition. They should be valuable as standards of comparison in model development projects (e.g., HGM guidebooks) and examples for the restoration of more severely degraded wetlands, especially those on private lands. Several wetlands were near trails (e.g., W046, W072, and W073) and have substantial potential for environmental education (Weeks 2002).

Ground Water

Crystalline rocks associated with the three parks are common in much of the Appalachia and are an important source of water. This type of geology does not typically produce high well yields, but is capable of providing yields sufficient for individual homes, farms, and small businesses. Most ground water wells obtain water from the zone of sediment overlying the rock. Ground water in unweathered crystalline rock occurs in joints, faults, and fractures. Ample water (yields up to 5 gpm) can usually be found for domestic needs. Higher yields are uncommon, although a carefully selected site could result in a higher yield. Larger well yields are typically found in valleys rather than hilltops, with fracture traces enhancing groundwater yields. While well yields/ground water are not too relevant to managing the NPS and state park areas, they are indicators of water in the underlying aquifer, which is important to seeps, springs, and small streams, and also to adjacent private properties outside the parks.

Water Quality

The National Military Park is at the top of its watershed, resulting in minimal external influence on park water resources. This environmental setting appears ideal for an NPS unit with regards to protecting and preserving the water resources. Over half of the boundary (south and east) of the National Military Park is shared with

* The Cowardin classification system for wetlands is a hierarchical subsystem of water flow; classes of substrate types; subclasses of vegetation types and dominant species; as well as flooding regimes and salinity levels for each system.

Kings Mountain State Park, providing additional protection to the natural systems. Kings Creek, which forms a small part of the park's northwest boundary, is the exception where most of Kings Creek's watershed lies outside the protection of federal and state lands.

Kings Mountain State Park is large enough that its streams drain into two major river basins, the Broad and the Catawba. There are also two lakes, Lake Crawford and Lake York, which are eutrophic lakes rich in plant nutrients but seasonally deficient in oxygen. Much of the park area is forested; however, there is substantial urbanization throughout both of the river sub-basins that drain the park, and point source discharges have a major impact on local water quality. Urban storm water runoff is a particularly serious factor, and Crowders Creek, which skirts much of the park, has been designated as impaired for most of its length by the N.C. Division of Water Quality (NCDWR 2004). Crowders Mountain State Park has a similar physiographic setting with surface waters and wetland seeps originating at the top of the watershed. The surface waters and wetland seeps in Crowders Mountain State Park have little human-influence and remain in good quality prior to draining off the park and into more urbanized water drainages.

3.5.2 Methodology and Intensity Threshold

The methodology used for assessing impacts to flood plains and wetlands included information compiled from the Kings Mountain National Military Park, Water Resource Scoping Report (Weeks 2002), Development of a Geo-Referenced Database To Identify and Inventory Wetlands at Kings Mountain National Military Park (Morgan 2003), Kings Mountain National Military Park General Management Plan, Crowders Mountain State Park General Management Plan, and with consultation with the parks' staff to identify the water resources present and identifying the potential effects to water resources (i.e., surface and ground water) by the action alternatives. The thresholds of change for the intensity and duration of an impact are defined as follows:

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

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

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

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

Duration:

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

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

3.5.3 Environmental Consequences

Alternative A—No Action

The No Action Alternative would be comprised of the fire management tools/strategies in the current fire management plan. Wildfire suppression, prescribed burning, and spot treatment of invasive plants by herbicide, and mowing of grass areas along roads and developed areas would be allowed. Under this alternative, hazard fuels would continue to be retained and/or accumulate in areas not treated by prescribed fire. This could increase the potential for intense wildfires, thus hindering restoration and maintenance of fire-adapted systems and other unique vegetation areas. High intensity wildfires could cause soil sterilization,

remove most vegetation and soil organic matter, or cause soil to repel water, resulting in short- to long-term, negligible to moderate, adverse impacts as increased turbidity, sedimentation (i.e., ash), and debris flushes with reduced water quality, and potentially large pulses of water are delivered to water bodies. High severity wildfires could also remove large areas of forests, which would reduce the ground water retention capacity of remaining land areas in the parks.

Wildfires and prescribed fires could burn/reduce vegetation along banks, resulting in increased water temperatures in streams due to limited shading and increased nutrient cycling, therefore decreasing the availability of oxygen to fish and other aquatic organisms. The amount of runoff would likely increase stream or river flows, changing the hydrologic regime and possibly increasing channel erosion in the short-term. The degree of impacts would depend on the severity, intensity, and extent of the wildland fire and rain events. Indirect effects would be adverse, minor to moderate, localized, long-term impacts due to increased soil erosion, turbidity, and sedimentation, reduced water quality, and potential pulses of water. In general prescribed fire is usually of lower intensity than wildfires, thus impacts following a prescribed fire would be reduced and/or eliminated during the “green-up” as new herbaceous cover developed.

In wildfire suppression tactics, fire engines and other equipment may be driven off-road to control the fire perimeter. In many areas of the parks, this would be difficult to impossible due to thick ground vegetation, trees, and steep or rocky slopes. With appropriate responses to wildfires, where existing barriers (roads, trails, natural barriers) are often the most practical firelines to contain a fire, there would be less fireline constructed and less off-road use of engines or fire support vehicles. If local surface water use occurred in the parks, the direct adverse effects of reduced flow would be localized, short-term (hours), and minor. Indirect adverse effects could include destabilizing stream banks or lakeshores due to shoreline trampling and equipment use. Minimizing off-road travel and prompt rehabilitation of any damaged shorelines or stream banks would mitigate these impacts.

Wildfires and prescribed fires are beneficial to water resources by providing an influx, but not an overwhelming flush of nutrients to the soil from the plant biomass burned. This stimulates seed production and new vegetation growth, and helps to perpetuate the vegetation and wildlife species associated with water resources, such as wetlands (Craft and Casey 2000, Battle and Golladay 2001). The influx of nutrients could have an adverse or beneficial effect on water quality depending on the amount and frequency of precipitation events, and the ability of remaining or new vegetation to act as a filter. The impacts are expected to be minor, short-term, and localized.

The use of fire retardants or foams administered by helicopter or fixed wing aircraft during large wildfire suppression could potentially cause short-term impacts to water resources if misapplied or mishandled. Normally, firefighters do not use retardant or foam within 300 feet of surface waters. Retardants contain ammonia and phosphate or sulfate ions, which can temporarily change the chemistry of a water body, thus making it lethal to fish and other aquatic organisms. Foams contain detergents that can interfere with the ability of fish gills to absorb oxygen. The degree of impact would depend on the volume of retardant/foam dropped into the water body, the size of the water body, and the volume of flow in the stream or river. However, since mitigation measures limit the use, type, and proximity to water bodies by foam and fire retardants, impacts to water quality would be minimal or negligible.

Cumulative Impacts

Cumulative impacts to water quality from other disturbances and existing practices in and around the parks include private facilities (septic tanks), trails and roads crossing streambeds, agricultural, mining, and roads leading to lakes. Regional growth and development is expected to result in natural lands being converted for development, which could alter the local hydrology. Development projects in the parks could also have site-specific impacts on water resources. Cumulative impacts to water resources from such actions would be minor, short-term, and adverse. The No Action Alternative in combination with the past, present, and

foreseeable future actions would result in both adverse and beneficial, minor, short- and long-term cumulative impacts.

Alternative B—Preferred Alternative

Under the Preferred Alternative, the management of wildland fires would be similar as described for the No Action Alternative. However, wildfires managed for multiple objectives including resource objectives over time would decrease the potential for intense, large wildfires and would move toward having impacts within the range of naturally occurring wildfires. Generally, wildfires managed for resource objectives are managed under less rigorous fire conditions than suppression oriented wildfires; thus, fire effects on vegetation are often not as intense. Retaining forest vegetation would also help stabilize the soil profile and water retention capacity of the parks' land areas. Over time, wildfires would be of lower intensity and there would be less need and use of fire suppression aircraft, leading to reduced use of fire retardant, helicopter foam, and water bucket drops. Thus, the Preferred Alternative would have indirect, minor to moderate, beneficial, long-term, and localized impacts by increasing the potential for lower intensity ground fires and increasing the overall health and vigor of vegetation communities.

The use of mechanical tools for hazard fuel reduction would increase the ability and efficiency to reduce fuel loads and to create and/or maintain defensible space, reducing the potential for an uncharacteristic wildfire. The increased reduction of hazard fuels would benefit water resources with localized, lower intensity ground fires that have less impact on soil erosion when compared to more intense wildfires and are easier to manage and/or suppress. Mechanical fuel reduction projects would not occur near streams or surface waters and impacts would be mitigated by avoidance, where possible, and immediate rehabilitation if impacts were unavoidable, using appropriate restoration measures. Direct impacts from mechanical fuel reduction treatments to water resources could be adverse, localized, short-term, and negligible due to trampling of riverbanks or similar disturbances by felled trees.

All herbicide treatment areas would have individual treatment plans, developed by the parks, employing specific mitigation measures (see section 2.6), after approval of herbicide use by NPS regional office or state park regional offices, as appropriate. Approvals may be given after considering numerous factors including: the target use, location where the application will occur, potential threatened and endangered species concerns, potential for getting into surface or ground water, persistence in the ecosystem, safety to employees and the public, and type of application (e.g. spot spraying). Furthermore, all herbicides used in or near water bodies or wetlands would be applied according to the labels to ensure potential for herbicide drift unlikely.

Cumulative Impacts

The past, present, and reasonably foreseeable future actions would be the same as described for water resources under the No Action Alternative. Cumulative impacts to water quality from the Preferred Alternative in combination with existing practices at the three parks would be direct, minor, short-term, adverse and beneficial. The Preferred Alternative would have a slight adverse contribution to cumulative impacts from the potential for a temporary increase in soil erosion, turbidity, and sedimentation, reduced water quality, and potential pulses of water. Contributions to beneficial cumulative impacts would be due to the increased potential for lower intensity ground fires and hazard fuel reduction that would have less impact on soils, thus less sedimentation and erosion.

Alternative C—No Wildfires Managed for Resource Objectives

Water quality impacts under this alternative would be the same as the Preferred Alternative; however, there would be no utilization of wildfires managed for multiple objectives including resource objectives. This would result in less reduction of hazard fuels compared to the Preferred Alternative and increase the probability of high severity wildfires, thus increased soil erosion, sedimentation, and turbidity over time. Impacts to vegetation along the stream banks could be more intense being full suppression oriented wildfires compared to wildfires managed for multiple objectives including resource objectives under the Preferred

Alternative. In addition, reduction of hazard fuels could be reduced, thus decreasing the potential for localized, lower intensity ground fires and the overall health and vigor of vegetation communities that serve as filters for water resources. This would result in direct, short-to long-term, localized, and minor to moderate adverse impacts.

Cumulative Impacts

Alternative C would have an increased potential for severe wildfire and associated fire-suppression activities due to the buildup of hazard fuels and less forest restoration. Overall, Alternative C activities combined with impacts on and off the parks that could affect water resources would be minor, short-term, and adverse. However, there is the potential for indirect impacts to water quality from future severe wildfires, which would be minor to moderate, long-term, adverse, and localized due to reduced acres of successful restoration and continued and increased hazard fuel buildup.

3.6 Vegetation

3.6.1 Affected Environment

The National Military Park, created because of its historic significance has stated objectives to “Restore and maintain the battlefield vegetation to how it appeared in 1780”, “Restore the rest of the park to natural pre-settlement fire -dependent vegetation landscape...” and “enhance Georgia aster and other fire-adapted species’ habitats (i.e. Turkey beard, riparian cane grass). These objectives are closely tied to management of fire at the National Military Park. Accordingly, the alternatives proposed in this EA will continue to affect the vegetation communities in the park, as it has since work in the National Military Park began under the 1999 FMP (NPS 1999).

Much of the information below comes from the 2004 vascular plant inventory by NaturServe (White et al. 2004) and the KIMO Vegetation Management Plan (Florida A&M University 2006). Fire dependent forest and vegetation communities were common in the area before settlement. The National Military Park had mixed forests with an open understory of native grasses with shortleaf pine (*Pinus echinata*) being a predominant species. The National Military Park is located adjacent to a ridge/geological feature with high fire frequency caused in part by southwest-northwest prevailing winds that parallel the ridge and pushed wildfires in certain pathways/directions. The top of Kings Mountain was almost bare, with rocks, grass, and scattered clumps of shortleaf pine, chestnut oak (*Quercus prinus*) and blackjack oak (*Q. marilandica*). Blackjack oak is strongly fire dependent. Shortleaf pine is a fire dependent species in open understories with an approximate fire frequency interval of five years. The upland areas had enough fire to clear out understory vegetation in pre-settlement times, to prevent the high-density forest that is found in much of the area today. Chestnut oak, which needs fire for regeneration, was found in mid-slope areas. Fire frequency likely ranged from 2–8 years on hot dryer sites to 50–100 years in more sheltered, wetter areas (Frost 2014 personal communication).

The National Military Park has a high diversity of ecological community types ranging from temporarily flooded bottomlands to very dry/xeric woodland slopes. Although a significant amount of the park is in an early successional vegetation stage, the majority of the park contains forests of at least 70 years of age. The most globally rare community in the park appears to be the *Piedmont Chestnut Oak–Blackjack Oak Woodland*. This xeric, fire dependent community may warrant special attention due to its relatively high global rank/rarity (G2G3^{*}). Other highly ranked communities that may warrant special attention include the *Piedmont Small Stream Sweetgum Forest*, the *Piedmont Seepage Wetland*, and the *Piedmont Mesic Basic Oak–Hickory Forest*. Each of these forests takes up a relatively small percentage of the park’s land but holds a

^{*} Conservation status ranks are based on a one to five scale, ranging from critically imperiled (G1) to demonstrably secure (G5).

relatively large percentage of the overall biodiversity of the park. In addition, although not considered a “natural community”, the old fields within the power line right of ways deserve continued management attention due to their high level of biodiversity and the fact that they provide habitat for uncommon/rare plant species such as Georgia aster (*Symphotrichum georgianum*).

Despite its close proximity to the heavily urbanized area known as the “Piedmont Crescent,” Crowders Mountain State Park is ecologically significant for its size and condition and it protects an impressive array of high quality natural communities and rare species. The park is almost entirely forested by a mixture of second or third growth forests, and its size and extent are unusual. Hardwood forests dominate much of the park, and biologists have documented nine natural community types, including one of the state’s finest examples of the vegetation community known as the *Low Elevation Rocky Summit*. To date, over 600 plant and animal species and over 50 rare species have been documented at Crowders Mountain State Park. Based on its analysis of the park’s natural communities, rare species, and cumulative biodiversity, the North Carolina Natural Heritage Program (NHP) has given the park a Biodiversity Rating of B2 (Very High), and an overall rating of V1 (Outstanding) (CMSP 2010).

The landscape at Crowders Mountain State Park is particularly notable for its prominent quartzite monadnocks at Crowders Mountain and Kings Pinnacle. Monadnocks usually rise quite abruptly above the surrounding landscape, and the park offers some of the state’s best examples of quartzite hogbacks. These crags support a variety of natural community types and mountain species across a range of elevations and aspects, including excellent examples of Low Elevation Rocky Summit in more rocky areas, and *Pine-Oak/Heath* in areas with shallow soils. *Piedmont Monadnock Forest* communities occur on the park’s highest forested ridges, and other natural community types that have been documented throughout the park include *Low Elevation Seep*; *Basic Mesic Forest*; *Dry-Mesic Oak-Hickory Forest*; *Dry Oak-Hickory Forest*; and *Xeric Hardpan Forest*. These communities support an array of rare species, including bear oak (*Quercus ilicifolia*), one of only four populations known in North Carolina; dwarf juniper (*Juniperus communis* var. *depressa*); Bradley’s spleenwort (*Asplenium bradleyi*); Appalachian golden-banner (*Thermopsis mollis*); Piedmont indigo-bush (*Amorpha schwerini*); and Biltmore carrion-flower (*Smilax biltmoriana*).

Detailed vegetation information was not available for Kings Mountain State Park at the time of this writing however; the general vegetative communities at Kings Mountain State Park are similar to those found in the National Military Park and Crowders Mountain State Park.

Invasive, Non-native Species

About 58 plant species in the National Military Park (11% of the species) are not native to the region (White et al. 2004). Most of these species were results of planting as ornamentals, past agricultural and forestry practices, or errant seed mixes. Twenty-one of the 58 non-native species are considered aggressive invasive species. These non-natives could actively out compete and replace native species, as they have in other parts of the Southeastern US (Miller 2000) and are a primary threat to the overall ecological health of the National Military Park (White et al. 2004). Along the wood edges, wisteria (*Wisteria floribunda* and *sinensis*) is present and could eventually overtake the canopy of stands, causing them to become monocultures of these invasive exotics and reducing biodiversity in the area. In the interior woods and forests, shrubs and vines such as Japanese honeysuckle (*Lonicera japonica*), and Chinese privet (*Ligustrum sinense/vulgare*) have begun to colonize areas of the understory. Much of the floodplain for the creeks that run through the park is heavily dominated by a combination of exotics, but especially Japanese stiltgrass (*Microstegium vimineum*) and Chinese privet. In the power line rights of way, both wet and dry, mulitflora rose (*Rosa multiflora*), mimosa (*Albizia julibrissin*), princess tree (*Paulownia tomentosa*), Chinese privet, and Chinese lespedeza (*Lespedeza cuneata*) have colonized areas and seem to be expanding in cover over time. Other species such as kudzu (*Pueraria montana*) and English ivy (*Hedera helix*) may need to be monitored to assure the current populations do not spread. In areas where exotics have become a monoculture, removal should occur in conjunction with planting and seeding of natives to help prevent quick re-colonization by the same or new invasive exotic species (White et al. 2004).

Nine non-native species have been documented in Crowders Mountain State Park—Chinese lespedeza, Japanese stiltgrass, autumn olive (*Elaeagnus umbellata*), Chinese privet, multiflora rose, mimosa, kudzu, princess tree (*Paulonia tomentosa*), and Japanese honeysuckle (CMSP 2010). Woody species management and kudzu eradication are high priorities.

Non-native plant species known to occur in Kings Mountain State Park include yucca (*Yucca* spp.), Japanese honeysuckle, privet, kudzu, wisteria, and English Ivey (KMSP 2014).

3.6.2 Methodology and Intensity Threshold

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

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

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

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

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

Duration:

Short: Recovers in 3 years or less.

Long: Recovers in more than 3 years.

3.6.3 Environmental Consequences

Alternative A—No Action

Under this alternative, the Kings Mountains Parks fire management programs would continue managing vegetation with prescribed fire, manual treatments, and targeted herbicide use for non-native species. The Kings Mountain Parks fire staff plan prescribed fires to achieve resource management and/or hazard fuel reduction objectives, such as reducing fuel loads to promote restoration and maintenance of fire-adapted vegetation communities and ecological restoration. Impacts from prescribed fires and wildfires are similar with the degree of impact depending on the fire intensity and severity, which depends on the time of year, fuel composition, and soil moisture.

Accumulation and retention of hazard fuels would continue in areas untreated, which would hinder restoration and maintenance of fire-adapted vegetation communities and reduce ecological restoration efforts. In addition, potential for localized, intense wildfires that could remove large tracts of vegetation would increase. Indirect effects to vegetation could be adverse, minor to moderate, localized, and long-term due to increased potential for locally severe fire effects on vegetation, including physical alteration of vegetation structure,

composition, and function and a resulting increased susceptibility to spread of invasive plants. This would also result in reduced resilience of the Kings Mountain Parks' ecosystems due to continued stress from drought, climate change, forest pest outbreaks, and wildfire.

Impacts to vegetation communities from wildfires depend on the fire intensity and severity. High intensity wildfires could remove soil organic matter, lower the soil pH and nitrogen content, or kill rhizomes and mycorrhiza, all of which, may result in short and long-term changes in vegetation communities. Bare and burned soil areas would also be susceptible to increased opportunities for invasive and non-native plant species to become established or spread. Following fire management actions or suppression activities areas would be monitored and invasive vegetation may be removed by manual or targeted herbicide treatments. Impacts from the spread of invasive weed species would be long-term and adverse if viable seeds are transported and become established. However, due to mitigation measures that would be used (i.e., cleaning of equipment before and after use, firelines re-contoured and covered with cut vegetation after suppression activities, monitoring of disturbance areas) impacts are expected to be negligible.

Wildland fire management actions, including suppression tactics, may be required, which could remove vegetation to create control lines, use of natural openings for helipad areas, or vehicles that carry personnel and equipment; wildland fire suppression activities could compact soils and temporarily remove or trample vegetation. However, MIST tactics would be used during wildland fire suppression to minimize the impact of fire control actions to soils and vegetation, thus reducing potential adverse impacts. The impacts to vegetation communities from fire suppression activities would be short-term, adverse, and negligible to minor.

Prescribed fires would benefit the native plant communities over the long term by rejuvenating the soils with nutrients, reducing fuel loads, promoting understory growth of grasses and forbs, reducing small tree and brush density, reducing competition with non-native species, and enhancing the diversity and vigor native vegetation communities. Prescribed fire could also increase production and/or seed germination of understory plant species and maintain native vegetation structure, composition, and function in fire-adapted plant communities. Over the long term, utilizing prescribed fire would be expected to reduce hazard fuel accumulations and decrease the potential size and intensity of wildfires. Maintaining traditional fire behavior would lead to increased vigor of fire-dependent vegetation found in the Kings Mountain Parks.

The use of prescribed fire could result in the loss of individual plants and localized communities of plants in the short-term, especially if not fire-adapted. However, prescribed fires are designed to be low intensity, ground fires that promote diverse species and seedbeds. Overall impacts would be beneficial, minor to moderate, long-term, localized by maintaining native vegetation structure, composition, and diversity of fire-maintained vegetation associations.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions that could impact vegetation resources include the numerous NPS and state park management plans that provide guidance for the protection and management of vegetation resources, development within the parks, and fire management activities within the parks and adjacent to the parks. The No Action Alternative in combination with the past, present, and reasonably foreseeable future actions would result in moderate, long-term, beneficial, and localized impacts due to improved health and vigor of vegetation communities and maintaining fire-adapted vegetation communities as well as adverse, minor to moderate, short-term, and localized due to future severe wildfires from potential fuel buildup.

Alternative B—Preferred Alternative

Impacts to vegetation communities would be similar to those described under the No Action Alternative with the spatial extent of adverse and beneficial impacts increasing as wildfires managed for multiple objectives including resource objectives would be allowed. The management of wildfires for multiple objectives including resource objectives could help to move further toward having impacts within the range of historic,

naturally occurring fires in the landscape, thus further reducing hazard fuels, and impacts from fire suppression activities in the long-term. Furthermore, wildland fire containment boundaries (natural or human made) might be more distant depending on the resource objectives and values to be protected, instead of immediate direct suppression.

The use of wildfires managed for multiple objectives including resource objectives could result in the loss of individuals and small communities of plants in the short-term, especially if not fire-adapted. However, overall impacts would be direct, minor to moderate, beneficial, long-term, and localized by restoring the native vegetation structure, composition, diversity, and function of historically fire-maintained vegetation associations.

In riparian habitat, wildfires managed for multiple objectives including resource objectives would generally be managed under less rigorous fire conditions than suppression oriented wildfires, thus effects on vegetation would not be expected to be as intense.

The use of mechanical treatments to reduce hazard fuels near buildings and structures in wildland urban interface (WUI) areas, to create/maintain defensible space, development of fuel breaks near private property boundaries, and to restore native forests would further protect and maintain native vegetation communities and associated wildlife species. Potential spread of invasive plants could occur from equipment used by fire crews (i.e., carried in on equipment from outside the area, mechanical fuel reduction treatment equipment, fireline construction equipment). Following fire management activities (e.g., wildland fires, hazard fuels reduction), areas that were treated would be monitored and invasive vegetation may be removed by manual or mechanical treatments or targeted herbicide use. Impacts from the spread of invasive weed species would be long-term and adverse if viable seeds are transported and become established. However, due to mitigation measures that would be used (i.e., cleaning of equipment before and after use, avoid burning when possible in areas at high risk for weed establishment or spread) impacts would be negligible.

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

Cumulative Impacts

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

Alternative C—No Management of Wildfires for Resource Objectives

Vegetation impacts under Alternative C would be the same as the Preferred Alternative; however, there would be no management of wildfires for multiple/resource objectives, only suppression. This would result in less reduction of hazard fuels compared to the Preferred Alternative and increase the probability of high severity wildfires, thus increased potential for removal of larger tracts of vegetation, physical alteration of vegetation structure, composition, and function and increased susceptibility to spread invasive plants. This could also result in reduced resilience and integrity of natural vegetation community values. Impacts to vegetation resources would be direct, short-to long-term, localized, minor to moderate, and adverse.

Cumulative Impacts

Alternative C, with no utilization of wildfires to achieve resource management goals, would have the similar impacts as the Preferred Alternative, except that vegetation communities could have increased adverse

impacts with increased potential for large, intense wildfires. Within the parks, the impacts to vegetation would be direct, moderate, long-term, beneficial, and localized.

3.7 Wildlife/Wildlife Habitat

3.7.1 Affected Environment

The Kings Mountain Parks are known for their diversity and abundance of wildlife. Wildlife documented in the National Military Park consists of 54 mammal species, 208 birds, 42 fish, 45 reptiles, 31 amphibians, and seven crustacean species (NPS 2014b). Over 600 wildlife species have been documented at Crowders Mountain State Park (CMSP 2010). To date, Crowders Mountain State Park has documented 19 mammal species, 167 birds, 9 fish species, 11 amphibians, 28 reptiles, and 10 mollusks (CMSP 2010). A complete inventory for Kings Mountain State Park does not exist at this time and needs to be completed for future reference (KMSP 2014). The distribution, abundance, and diversity of species within the Kings Mountain Parks vary by season and variety of habitats present.

Principal uses of the parks by wildlife include breeding, sheltering, and foraging. Many animal activities such as foraging and mating are temporally stratified among diurnal, nocturnal, and crepuscular animals. Animal activities are further stratified spatially among ground, understory, mid-story, and canopy dwelling species. The parks are also used for several months each spring and summer by multiple species of Neotropical migrant birds. Species that winter south of the parks and breed north of the parks pass through during migration and may remain from one to several days to forage and refuel. Many species of birds breed in the park, including year-round residents and migrants that only occur during the growing season. Other bird species use the parks for wintering grounds and only occur during the non-growing season. The diverse habitats in the parks offer various types of ground and vegetative structures in which animals may burrow, den, and nest.

3.7.2 Methodology and Intensity Threshold

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

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

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

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

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

Duration:

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

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

3.7.3 Environmental Consequences

Alternative A—No Action Alternative

Existing vegetation/fuel management would continue under this alternative. Wildlife species would respond to wildfires and prescribed fires in the same manner with the degree of impacts depending on the time of year, size, location, fuel composition, and other variables. Wildland fire suppression tactics would temporarily increase disturbance to individuals within and near the burn area due to increased noise and human presence and equipment, smoke, fire itself, and soil disturbance. Additional disturbances to wildlife could result from low-level fixed winged aircraft flights and retardant drops that could be used in fire suppression actions. In addition, reproduction and survival for individuals could be impacted by loss of foraging habitat after a high intensity wildfire. Temporary loss of habitat and displacement may occur for individuals within the burn area. Mortality to wildlife species that are small and less mobile such as, small mammals, lizards, and snakes, may also occur from wildfires, while larger animals may not be able to move out of the fire path in time becoming disoriented by the wildfire.

Prescribed fire could benefit individual wildlife species and their habitat by emulating the natural fire regime and creating a more historic and natural vegetation pattern across the parks (creating localized, but not widespread areas of early succession vegetation), enhancing the variety and diversity of vegetation communities and wildlife habitat present (Keyser and Ford 2005). Prescribed fires would provide more nutrients to the soils in the short-term, which would increase new plant growth and improve the amount of ground and grass species available and the nutritional quality of this forage for wildlife species. Burned areas generally green up earlier than non-burned areas, thus providing earlier grazing (Redmon and Bidwell 2003). The effects of treatments on forest understory composition and growth vary. A study in Piedmont pine-dominated forest in South Carolina found that post treatment sapling densities and graminoid forb cover differed among fire, thinning, and fire combined with thinning treatments (Phillips and Waldrop 2008). Overall, the use of fire and other tools to recreate historic forest conditions is recommended for wildlife because it helps restore a mosaic of ecosystem types that can benefit multiple species (Van Lear and Harlow 2000). Thus, the No Action Alternative would have beneficial, minor to moderate, long-term, localized impacts by maintaining and/or restoring the abundance and diversity of fire-adapted vegetation communities and wildlife habitat present and reducing the potential for future severe wildfires.

Prescribed fires could directly impact nesting resident and migratory birds if conducted during the breeding season (generally between March–August) through mortality of fledglings that are unable to flee or avoid smoke or fire. Prescribed fires would be implemented, when possible, outside the breeding season and/or avoiding main nesting areas to mitigate potential impacts. Effects on breeding success would vary by species and is difficult to predict as bird abundance and species richness often do not change or increases several years following fire, but species dependent on dense shrubs typically decline (Zebehazy et al. 2004, Greenburg et al. 2007) and species preferring more open areas could increase. Some forest-nesting birds could become more susceptible to nest parasitism by Brown-headed Cowbirds (*Molothrus ater*) due to the opening of the understory and increased open areas. Edge habitat, which could increase cowbird access to interior forest birds, would not change as existing human-made corridors and natural barriers would be used for firelines when possible. The local raccoon population could also affect avian breeding season success because of this animal's tendency to predate nests. A study conducted in longleaf pine and mixed pine–oak habitats found that raccoons were 52% and 80% less likely to occur in two study stands burned the previous growing season compared to unburned stands (Jones et al. 2004).

Accumulation and retention of hazard fuels (e.g., dense brush, small trees) would continue in areas untreated, which would hinder restoration and maintenance of fire-adapted vegetation communities and reduce ecological restoration efforts. The continued accumulation and retention of areas with dense brush and small trees could change species composition and the structure of native vegetation, leading to a more homogenous habitat state, reducing wildlife habitat quality. Fire dependent vegetation may decrease in prevalence and vigor with negative effects on wildlife species adapted to those vegetation types. In addition, potential for

localized, intense wildfires that could remove large tracts of vegetation would increase. Indirect effects to vegetation could be adverse, minor to moderate, localized, and long-term due to increased potential for locally severe fire effects on vegetation, including physical alteration of vegetation structure, composition, and function. Impacts on wildlife habitat and individuals due to increased potential for localized severe fire effects and changes in wildlife habitat quality would be indirect, adverse, negligible to moderate, and long term.

The general wildlife communities under the No Action Alternative would be expected to remain as they currently exist. However, an intense wildfire could alter the current vegetation in ways that would drastically alter wildlife communities. Communities would initially be limited to those that could colonize recently burned areas and would slowly shift to early successional communities.

Cumulative Impacts

Past, current and reasonably foreseeable actions that may contribute to cumulative impacts of wildlife include the ongoing development and fire management activities within the Kings Mountain Parks, commuter traffic along the Interstate 85 corridor and around Charlotte, NC, and wildland fires on adjacent lands. Cumulative impacts resulting from the No Action Alternative in combination with the past, current, and reasonably foreseeable actions would be adverse, minor, short-term, localized impacts due to increased noise and disturbance to wildlife as well as beneficial, minor, long-term, and localized due to improved habitat quality and maintained and/or restored fire-adapted vegetation communities.

Alternative B—Preferred Alternative

Impacts to wildlife and their habitat would be similar as described under the No Action Alternative with the spatial extent of adverse and beneficial impacts increasing as wildfires managed for multiple objectives including resource objectives and mechanical treatments to reduce hazard fuels and to create and/or maintain defensible space and fuel breaks is allowed. The management of wildfires for multiple objectives including resource objectives and mechanical treatments would further reduce hazard fuels and wildland fires requiring suppression actions. In addition, the ability to reduce more hazard fuels (i.e., dense brush, small trees) would increase wildlife habitat quality and ground forage available. It would increase the potential for lower-intensity ground fires, which are easier to manage/suppress and have less impact on wildlife and their habitats. Thus, the Preferred Alternative would have minor to moderate, beneficial, long-term impacts by restoring the variety and diversity of vegetation communities and wildlife habitat present and minimizing the potential for future severe wildfires.

The use of mechanical treatments to reduce hazard fuels and to create and/or maintain defensible space and fuel breaks would also increase the potential for localized, lower intensity ground fires further protecting and maintaining native wildlife species and their habitat. Temporary displacement or disturbance to wildlife species within and near the treatment areas would occur from equipment use and field crews. Impacts to wildlife and their habitat would be beneficial, long-term, and minor to moderate as well as short-term, adverse, and negligible to minor.

In riparian habitat, wildfires managed for multiple objectives including resource objectives would generally be managed under less rigorous fire conditions than suppression oriented wildfires, thus effects on habitat would not be expected to be as intense.

Targeted herbicide application as a follow up treatment to mechanical treatments, such as foliar application to specific basal or foliar plant areas, would minimize chances for overspray and applying to non-target plants. Thus, mitigation measures, limited use, low-volume application of herbicide to specific basal or foliar plant areas, and following all labels would minimize chances for overspray and impacting non-target plants. In addition, herbicides commonly used for vegetation management (e.g., triclopyr [Garlon 4/Element 4], glyphosate, imazapyr, sulfometuron, metsulfuron methyl, hexazinone) have been designed to target biochemical processes unique to plants and have low levels of direct toxicity or risk to wildlife and fish when used in accordance with label specifications (Tatum 2004). Herbicides commonly used for vegetation

management also degrade quickly upon entering the environment and are neither persistent nor bioaccumulate (Tatum 2004). Over time, using targeted herbicide as a follow-up treatment to reduce and/or maintain brush regrowth along fuel breaks would reduce and/or cease the need for repetitive mechanical work, thus minimizing reoccurring disturbances to wildlife.

Cumulative Impacts

The past, present, and reasonably foreseeable future actions would be the same as described for the No Action Alternative. Cumulative impacts would be the same as described under the No Action Alternative with beneficial, minor, long-term, and localized due to improved habitat quality and maintained and/or restored fire-adapted vegetation communities as well as adverse, short-term, localized impacts due to increased noise and disturbance to individuals within and near the treatment area.

Alternative C—No Management of Wildfires for Resource Objectives

Impacts to wildlife and their habitat would be the same as the Preferred Alternative; however, there would be no management of wildfires for multiple/resource objectives, only suppression. This would result in less reduction of hazard fuels compared to the Preferred Alternative and increase the probability of high severity wildfires, thus increased potential for removal of larger tracts of vegetation. This could result in reduced resilience and integrity of native wildlife and their habitat. Impacts to wildlife and their habitat would be direct, adverse, short-to long-term, localized, and minor to moderate.

In riparian habitat, wildfires managed for full suppression would generally be managed under more rigorous fire conditions than wildfires managed for multiple/resource objectives, thus effects on habitat would be expected to be more intense.

Cumulative Impacts

Alternative C, with no utilization of wildfires to achieve resource management goals, would have similar impacts as the Preferred Alternative, except that adverse impacts to wildlife and their habitat would be greater compared to the Preferred Alternative with increased potential for intense wildfires and associated full suppression tactics. Within the parks, the cumulative impacts to wildlife and their habitat would be direct, minor to moderate, long-term, beneficial, and localized. Overall, adverse impacts would be negligible to minor and short to long term.

3.8 Species of Special Concern

3.8.1 Affected Environment

Federally and State-listed threatened, endangered, or candidate species, and other species of concern specific to the parks occurring or potentially occurring at are discussed in this section. Table 5 provides a comprehensive list of those species, their habitat, and potential known threats.

There are numerous protected species that either are documented on, or may potentially pass through, the Kings Mountain Parks. Two federally listed species—the Carolina heelsplitter, a federally endangered crustacean, and the Northern long-eared bat, federally threatened—may be impacted by fire management activities. Five North Carolina special concern species may be impacted by the proposed fire management activities, the Cooper’s Hawk (*Accipiter cooperii*), Brown Creeper (*Certhia americana*), Little Blue Heron (*Egretta caerulea*), timber rattlesnake (*Crotalus horridus*) and the Carolina pigmy rattlesnake (*Sistrurus miliarius*) (CMSP 2010). One South Carolina listed species may be impacted by the proposed fire management activities, Bald Eagle (*Haliaeetus leucocephalus*).

The Kings Mountain Parks have no known federally protected plant species, but Kings Mountain National Military Park does have a North Carolina listed species and special concern species and Crowders Mountain

State Park has seven state listed plant species that could be impacted by the proposed fire management actions (Table 5).

TABLE 5. STATE AND FEDERALLY PROTECTED SPECIES POTENTIALLY OCCURRING AT KIMO, KMSP, AND/OR CMSP.

Species	Federal T&E Status	State T&E Status	Habitat	Potential to Occur
Mammals				
Northern long-eared bat <i>(Myotis septentrionalis)</i>	T	—	Summer roosts in tree bark & cavities, snags. Occasionally caves or mines. Winter hibernacula are typically in caves or mines (USFWS 2015).	Known to inhabit the surrounding areas and could occur within the parks.
Birds				
Cooper's Hawk <i>(Accipiter cooperii)</i>	MBTA	NC SCS	Occurs in forested habitats including wooded areas in towns.	Could occur at all three parks and is documented as breeding at CMSP and as occasional migrant at KIMO.
Brown Creeper <i>(Certhia americana)</i>	MBTA	NC SCS	Occurs in mature forests, especially ponderosa pine in SE. Needs cavities for nesting.	Could occur throughout forested areas of all the parks. This bird is documented as rare in KIMO.
Little Blue Heron <i>(Egretta caerulea)</i>	MBTA	NC SCS	Nest in woody plants around water. Rare in central and western Carolinas.	The Little Blue Heron has been documented at CMSP.
Bald eagle <i>(Haliaeetus leucocephalus)</i>	BGEPA	SC T	Occurs around large bodies of water with fish. Nest in trees or snags near water. Reintroduced in NC and recovering.	Bald Eagles have been documented as a migrant in KIMO and CMSP.
Crustacean				
Carolina heelsplitter <i>(Lasmigona decorata)</i>	E	—	Occurs in Piedmont streams and rivers. Only 10 populations now known in 3 river systems.	Carolina heelsplitter has not been documented in any of the parks. However, portions of CMSP are in the Catawba River watershed, which contains one of the

Species	Federal T&E Status	State T&E Status	Habitat	Potential to Occur
				few known populations of Carolina heelsplitters.
Reptiles				
Timber rattlesnake (<i>Crotalus horridus</i>)	—	NC SCS	Wide variety of habitats but less common in urban areas.	Timber rattlesnake has been documented in KIMO and CMSP. Sightings in CMSP are uncommon.
Carolina pygmy rattlesnake (<i>Sistrurus miliarius</i>)	—	NC SCS	Areas near water in a variety of habitats. Drier habitats in Carolinas such as sandhills and pine forests (Meadows and Wilson 2015).	Last sighting in CMSP was in 1984, thus it seems unlikely that a viable population remains.
Plants				
Dwarf juniper (<i>Juniperus communis</i> var. <i>depressa</i>)	—	NC SCS	Thin soil around rock outcrops on mountain summits and Piedmont monadnocks and rocky bluffs (Weakley 2012).	Tree has been documented in CMSP.
Bigleaf Magnolia (<i>Magnolia macrophylla</i>)	—	NC T	Mesic forests, primarily over limestone, other calcareous sedimentary rocks (calcareous shales, sandstones, etc.), or mafic rocks east of the Blue Ridge (Weakley 2012).	Tree has been documented in CMSP.
Greenland sandwort (<i>Minuartia groenlandica</i>)	—	NC T	Rock outcrops, also disjunct on the summits of quartzite monadnocks in the upper Piedmont (Weakley 2012).	Plant has been documented in CMSP.
Divided-leaf ragwort (<i>Packera millefolium</i>)	—	NC T	Granitic domes, cliffs, and rocky woodlands, over granite, gneiss, schist, and amphibolite, and in calcareous glades (Weakley 2012).	Plant has been documented in CMSP.
Bear oak	—	NC E	Xeric soils in ridges in	Tree has been

Species	Federal T&E Status	State T&E Status	Habitat	Potential to Occur
<i>(Quercus ilicifolia)</i>			monadnocks in the upper Piedmont and other dry sites (Weakley 2012).	documented in CMSP.
Georgia aster <i>(Symphyotrichum georgianum)</i>	—	NC T	Dry, rocky woodlands, woodland borders, road banks, power line rights-of-way, primarily in places that formerly would have burned. Also in thin soils around granitic flatrocks (Weakley 2012).	In KIMO, Georgia aster occurs along Piedmont Road and power line right of ways that have been cut and burned occasionally. Last observation in CMSP was in 1904.
Appalachian golden-banner <i>(Thermopsis mollis)</i>	—	NC SCS	Dry slopes and rides (Weakley 2012).	Plant has been documented in KIMO and CMSP.

T, E, and C = Threatened, Endangered, and Candidate species. NC SCS = North Carolina Special Concern Species. SC = Special concern. MBTA = Migratory Bird Treaty Act. BGEPA = Bald and Golden Eagle Protection Act.

3.8.2 Methodology and Intensity Threshold

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

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

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

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

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

Duration:

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

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

3.8.3 Environmental Consequences

Alternative A—No Action

Impacts Common to All Species

Under this alternative, the current fire management programs would continue. Special status species would respond to wildfires and prescribed fires in the same manner with the degree of impacts depending on the time of year, size, location, fuel composition, and other variables. Wildland fire suppression tactics such as construction of firelines, fire retardant associated with suppression activities, and noise from human presence and fire equipment could temporarily displace or stress special status wildlife species within and near the burn area.

Utilizing prescribed fires to reduce hazard fuels would increase the potential for lower-intensity ground fires, which are easier to manage/suppress and have less impact on special status species and their habitats. In addition, prescribed burns could open the mid-story vegetation layer in areas to promote growth and germination of sparse herbaceous patches. Prescribed burn plans would include mitigation measures to minimize any potential impacts to this species and its habitat. Thus, the No Action Alternative would have negligible to moderate, beneficial, long-term impacts to special status species by restoring fire-dependent vegetation communities and minimizing the potential for future severe wildfires.

However, relying on prescribed fires as the primary vegetation/fuels management tool would reduce the ability and efficiency to restore fire-adapted ecosystems, and restore fire as a natural ecological process to the landscape, both of which would benefit fire-dependent special status species. In untreated areas, hazard fuels would likely continue to be retained and accumulate, which could lead to increased potential for severe and intense wildfires that are difficult to suppress/manage. Severe and intense wildfires could remove large tracts of vegetation, causing habitat loss and displacement of special status species. Without sufficient ecological restoration in fire-adapted habitats, brush and small trees would continue to increase in density and abundance, potentially changing species composition and structure of native vegetation and forest, leading to a more homogenous habitat state.

Mammals

Northern long-eared bat—Northern long-eared bats depend on larger trees and snags to provide cavities for roosting. Some large snags could be lost if burned during prescribed fire, but mitigations such as scraping could reduce this loss, and prescribed fires inevitably create some new snags. Snags could be created long term depending on the frequency of fire. While the use of herbicides could alter vegetation and thus insect availability in the treatment areas, however, a more diverse vegetation community in the absence of invasive weeds is likely to support a larger assortment of insects on which bats prey.

Northern long-eared bats have been shown to select roost sites with different characteristics in fire-managed areas compared to unmanaged areas in Appalachian forests. Johnson et al. (2009) found that bats in fire-managed areas selected roost cavity trees that were smaller in diameter, higher in crown class, and located in stands with lower basal area, gentler slopes, and had higher percentage of fire-killed stems than randomly selected trees. Roosts were often surrounded by trees in the upper crown classes, were associated with larger canopy gaps, and had higher daily mean and max temperatures compared to roost in unmanaged forests. Fire-managed areas also had more available roost sites. Lacki et al. (2009) found that home ranges and foraging behavior in northern long-eared bats did not differ in forests before and after prescribed fire. Bat home ranges were closer to burned areas, which had higher abundances of insects. Bats also chose roosts after fires in trees with a greater number of cavities and a higher percentage of bark coverage. More roosts were observed in burned areas than in unburned habitats. They concluded that prescribed fire may benefit bats. Johnson et al. (2012) found that prescribed fire could affect availability and distribution of roosts within roost tree networks. Thus, this alternative may impact bats, but habitat and occupancy should still remain and occur, and impacts would be negligible to minor and of long duration due to the time scale of forest succession and snag life.

Fire may affect bats directly via heat and smoke that could potentially drift into rocky cliffs and cave roost sites or disrupting roosting and indirectly by modifying habitat, but these effects are largely unknown and likely vary by season and roost guild (Perry 2012). Studies suggest fire generally has beneficial effects on bat habitat by creating snags, reducing understory and midstory vegetation, opening forests, and possibly by increasing insect prey abundance (Perry 2012). Thus, impacts of this alternative would likely be beneficial, minor, and long term for northern long-eared bats.

In untreated areas, hazard fuels would likely continue to accumulate, increasing the potential for localized, severe wildfires. The No Action Alternative is not likely to lead to a reduction of available large trees or snags in the area; however in the longer term more high severity wildfires may result in the loss of greater numbers of large trees and snags. Specific mitigation measures have been developed for northern long-eared bats to minimize adverse impacts (USFWS 2016) (See Section 2.6).

Birds

Cooper's Hawks—Cooper's Hawks may react to fire in multiple ways. Nesting habitat could be reduced in intense fire, while thinning of understory habitat could alter numbers and composition of avian species on which hawks rely. Multiple studies have showed that bird communities in Piedmont and Appalachian forests respond to fire. Bird abundance and species richness often does not change or increases several years following fire, with species dependent on dense shrubs typically declining (Zebehazy et al. 2004, Greenburg et al. 2007). None of these studies showed an overall reduction in bird numbers and thus potential prey. Effects of fire on the conspecific Sharp-shinned Hawk (*Accipiter striatus*) are reported to reduce potential nesting habitat but increase foraging habitat due to opening of forests (Sullivan 1994 and reference therein). Nesting habitat may still be adequate if larger canopy trees are left intact and habitat is not too savannah like. Fire management should be planned outside of the avian breeding season or nesting birds could be impacted. Overall, impacts to Cooper's Hawks under this alternative would be negligible.

The buildup of hazard fuels in untreated areas could lead to localized, severe wildfires, thus loss of current and future nest trees and loss of habitat for prey species, thus reducing the abundance of prey available for the Cooper's Hawk. Indirect effects would be adverse, minor to moderate, localized, long-term impacts due to increased potential for locally severe wildfire effects on individual Cooper's Hawks and their habitat. Impacts to Cooper's Hawk habitat would be adverse, localized, minor to moderate, and short- to long-term.

Brown Creeper—The Brown Creeper typically nests and forages on larger trees. Loss of large trees with textured bark and snags could reduce the potential for Brown Creeper occupancy in the area. Prescribed fires would have minor, short-term, adverse, localized impacts on individuals due to disturbance and/or displacement within a burn unit area and potential destruction of dead snags. Typically, prescribed fires are low intensity ground fires and should not impact textured bark or snags present. Fire management should be planned outside of the avian breeding season or nesting birds could be impacted.

The buildup of hazard fuels in untreated areas could lead to severe habitat loss of current and future dead snags and large trees used for foraging. Indirect effects would be adverse, minor to moderate, localized, long-term impacts due to increased potential for locally severe wildfire effects on individual Brown Creepers and their habitat. Impacts to Brown Creeper habitat would be adverse, localized, minor to moderate, and short- to long-term.

Bald Eagle—Prescribed fires would have minor, short-term, adverse, localized impacts on individuals due to disturbance and/or displacement within a burn unit area and potential destruction of hunting perches (e.g., dead snags). Prescribed burn plans would include mitigation measures to minimize any potential impacts to this species. If eagle nests are discovered, fire management activities should be avoided all through the nesting season. Impacts would be negligible if mitigation measures are followed.

The buildup of hazard fuels in untreated areas could lead to severe habitat loss of current and future hunting perches and roosting sites along with altered aquatic prey habitat due to potential increased sedimentation to

adjacent creeks. Indirect effects would be adverse, minor to moderate, localized, long-term impacts due to increased potential for locally severe wildfire effects on individual Bald Eagles and their habitat. Impacts to bald eagle habitat would be adverse, localized, minor to moderate, and short- to long-term.

Little Blue Heron—Little Blue Herons are in general are not highly susceptible to the effects of fire. Prescribed fires may be proposed and carried out during heron nesting season under the No Action Alternative depending on conditions that are required to successfully accomplish the objectives of the burn. Prescribed burns would be conducted with the intention of avoiding potential impacts to herons. While there is some potential for adult and fledgling herons to be affected, the likelihood is very small because they are likely to move away from a fire or fire management disturbance, and they tend to forage in water 2–6 inches deep in open areas that would not be likely to burn. Furthermore, potential risks to heron nests would be mitigated through avoidance of nesting colonies, and most nesting colonies are well known and monitored. Under the No Action Alternative, fires have the potential to improve heron foraging habitat by reducing vegetation density that may interfere with access to prey. Fires may also help reduce encroachment of woody invasive species in areas.

Fire management, aviation, wildfire operations, effects monitoring, and other fire-related activities could temporarily disturb herons. Disturbance resulting from aviation activities and the presence of fire management and monitoring personnel may cause temporary changes in behavior that may affect normal breeding, feeding, and sheltering, and could increase risk of predation of eggs and nestlings if disturbances occur near a nesting colony. Disturbance of nesting birds is unlikely because of mitigation measures to avoid active nesting colonies. Foraging birds are likely to respond to disturbance by moving out of the area. The No Action Alternative would have short-term, minor adverse impacts to Little Blue Herons, and short-term beneficial effects. These impacts would be local.

Reptiles

Timber and Carolina pygmy rattlesnake—The timber rattlesnake and Carolina pygmy rattlesnake may benefit from prescribed fire. Greenberg and Waldrop (2008) found that reptile abundance increased in Appalachian upland forests following prescribed fire. Timber rattlesnakes would not likely be directly killed during fires unless burning occurs during shedding (Ulev 2008 and references therein). Denning snakes, which use rocky areas, are not likely to be impacted, but summer habitat could be negatively impacted because rattlesnakes prefer leaf litter and woody debris (Ulev 2008), which could be reduced. Summer habitat conditions may improve between fire intervals when debris and litter build back up. Data on effects of fire and herbicide use on rattlesnakes are lacking in general. Based on this information, impacts to both species would be adverse, minor, and of short duration.

Untreated areas would likely continue to accumulate hazard fuels, which could lead to localized intense and severe wildfires that are difficult to suppress/ manage. These uncontrollable wildfires could sterilize the soil and destroy plant communities; that could lead to severe habitat loss and mortality of individuals. Although snakes move across the landscape quickly and retreat to burrows or other refugia when disturbed, some snakes may become caught in fires and these individuals may be injured or killed. Indirect effects would be adverse, minor to moderate, localized, long-term impacts due to increased potential for locally severe fire effects on individual rattlesnakes and their habitat.

Crustaceans

The Carolina heelsplitter has not been documented in any of the parks, but Crowders Mountain State Park includes the Catawba River watershed, which contains one of the few known populations of Carolina heelsplitters. Watershed protection mitigation measures would help preserve water quality in the Crowders Mountain State Park watershed. Some post-fire ash runoff could occur during precipitation events. However, impacts would be negligible if mitigation measures are followed.

Plants

Wildland fire may result in injury or mortality of individual special status species plants. The likelihood of mortality depends on adaptations specific to each species and the intensity, severity, and size of the fire. Low intensity, ground fires that typically occur with prescribed fires and in areas with lower fuel loads are less likely to result in injury or mortality than high intensity fires that could occur in areas with greater fuel loads.

It is anticipated that mortality of individual special status plant species is likely to occur with prescribed fire. It is also anticipated that regularly recurring fire would maintain conditions required for establishment of new individuals of fire-adapted species (i.e., Georgia aster, bear oak, Appalachian golden-banner). Fire management activities carried out under the No Action Alternative would result in reduced fuel loads and subsequently localized, lower intensity ground fires. These conditions are most likely to represent the greatest chance of long-term survival of the state listed special status plant species. Park fire management staff would be able to plan prescribed fires for habitat maintenance. As a result, the timing, frequency, intensity and spatial area would be more predictable and could be modified as new data emerges. Due to the potential for limited mortality of individuals with the application of prescribed fire, management under the No Action Alternative would lead to short-term, negligible to minor adverse impacts to the state listed special status plant species.

Georgia aster, Appalachian golden-banner, and Bear oak—Due to the potential for long-term maintenance of habitats by prescribed fire, which is required by Georgia aster, bear oak, and Appalachian golden-banner, impacts of management under the No Action Alternative would be long-term and beneficial. Prescribed fires are designed to reduce fuel loads and maintain open areas, which encourages the regeneration and recruitment of these fire dependent species (Gucker 2006, USFWS 2005, Carey 1994). Bear oaks resprout from crowns prolifically and thrive post fire (Gucker 2006). The use of fire is the best alternative for restoring this tree in the parks. In addition, both Georgia aster and Appalachian golden-banner respond well to prescribed fires as they both occur in open areas that are maintained by periodic fires (Carey 1994, USFWS 2005, 2014). Georgia asters require disturbance, such as wildfire or prescribed fire to maintain and enhance suitable habitat conditions. In Georgia, populations that have been maintained by periodic prescribed fires increased the number of flowering stems present and new populations were found in the treated areas (USFWS 2014). One of the prescribed burn areas in Georgia showed a 25-fold increase in aster stem counts compared to the pre-fire counts, with the aster population expanding into the fireline that was constructed (USFWS 2014).

Georgia aster may also be benefiting from the current mowing of open areas (utility right-of-ways; Owen 2005). Many of the eminent populations exist along road right-of-ways where habitat is maintained by right-of-way mowing (USFWS 2005). Mowing may also benefit this species because it grows from seeds and rhizomes in open areas. Mowing in areas would reduce competitive forbs and grasses, and possibly allow aster to colonize. Mowing combined with fire is the best in terms of preservation and recovery of these two species because of their preferences for fire. Under the No Action Alternative impacts would be minor to moderate, beneficial, and of long duration for the local populations.

Dwarf juniper, Bigleaf magnolia, Greenland sandwort, and Divided-leaf ragwort—Hazard fuels would likely continue to accumulate in untreated areas, which could lead to increased potential for local intense and severe wildfires. Intense and severe wildfires could kill or injure individual special status plants or stands, especially species that are not fire dependent, such as dwarf juniper, bigleaf magnolia, Greenland sandwort, and divided-leaf ragwort. However, dwarf junipers, Greenland sandwort, and divided-leaf ragwort inhabit rocky areas and are not likely to be impacted by wildfires unless burning under extreme conditions.

Bigleaf Magnolia occurs in more mesic forest stands and is thus not likely to be fire adapted like some of the other magnolias. Larger trees are still likely to survive low-intensity ground fires, but regeneration of trees via seeds and seedling establishment may be impacted depending on fire frequency. The reduction of fuels using low intensity prescribed fires, which in turn would reduce the chance of large, intense wildfire, would benefit

this tree and the forest as a whole. Impacts to this species would be adverse, negligible to minor, and long term.

No Action Alternative impacts to Dwarf juniper, Bigleaf magnolia, Greenland sandwort, and Divided-leaf ragwort would be adverse, negligible to moderate, short-term, as potential for severe wildfires would increase under this scenario and mortality or injury from prescribed fires could occur. Beneficial impacts from utilizing prescribed fires to reduce hazard fuels would be minor to moderate, and localized.

Cumulative Impacts

Past, current and reasonably foreseeable actions that may contribute to cumulative impacts of special status species include the ongoing development and fire management activities within the Kings Mountain Parks, commuter traffic along the Interstate 85 corridor and around Charlotte, NC, and wildland fires on adjacent lands. Cumulative impacts resulting from the No Action Alternative in combination with the past, current, and reasonably foreseeable actions would be adverse, minor, short-term, localized impacts due to increased noise and disturbance to wildlife special status species and potential injury or mortality of individual special status plant species. Beneficial, impacts would be minor, long-term, and localized due to improved habitat quality and maintained and/or restored fire-adapted vegetation communities.

Section 7 Determination of Effect. Alternative A would have no effect on the Carolina heelsplitter because none have been documented in any of the parks and mitigation measures would be implemented to avoid adverse impacts to water quality in the Catawba River watershed (includes Crowders Mountain State Park) resulting from fire management activities. Alternative A may affect but is not likely to adversely affect the northern long-eared bat because bat habitat could be improved through the use of fire, and mitigation measures would be implemented to avoid adverse impacts resulting from fire management activities.

Alternative B—Preferred Alternative

Impacts resulting from mechanical treatment, prescribed fire, and wildland fire suppression would be similar to those described under the No Action Alternative—short-term, adverse and long-term, beneficial. Potential impacts to mammals as a result of managed wildland fire would be similar to those described for prescribed fire under the No Action Alternative. The primary difference between the No Action Alternative and the Proposed Action is the use of wildland fire for multiple objectives including resource objectives, which would allow the parks to manage unplanned ignitions. Unplanned ignitions would be managed under conditions that allow wildfires to burn without high severity, similar to how fires naturally burned in the area before historic settlement activities. Based on the wildfire history of the Kings Mountain Parks, approximately three unplanned wildfire incidents occur annually. Under the Proposed Action, it is possible that up to 3,000 acres annually could be treated by fuels and vegetation management activities,

Mechanical treatments would be primarily used to reduce hazard fuels, create/maintain defensible space and fuel breaks, and help in forest restoration by reducing brush and small trees. These actions would increase the potential for lower-intensity ground fires, which are easier to manage/suppress, are more beneficial for restoration, and help to further protect and maintain special status species and their habitat. The timber rattlesnake and Carolina pygmy rattlesnake may benefit from mechanical treatments. One study conducted in mixed pine–hardwood forest in Piedmont South Carolina found higher snake species richness in thinned plots than burned plots (Kilpatrick et al. 2004). Mechanical treatments could cause temporary displacement or disturbance to special status wildlife species within and near the treatment areas from equipment use, noise, and presence of field crews. Mechanical treatments are not expected to impact special status plant species; bear oaks over six inches in diameter would not be removed, and other special status plant species would be avoided and not removed by mechanical treatments.

Individual wildlife species in less mobile life stages (juvenile or roosting) and less mobile, small mammal species could be adversely affected by the use of wildfire managed for multiple/resource objectives and prescribed fire. However, most species in the Kings Mountain Parks evolved in the presence of fire and have

behavioral and other adaptations making populations resilient to fire; especially fire that mimics what was naturally present in the area (low-intensity surface fire). Based on the fire history of the Kings Mountain Parks, it is most likely that suitable and available habitat for many wildlife species would persist in other areas of the park during prescribed fire or wildfire managed for multiple/resource objectives. Foraging opportunities may decrease for some species during the disturbance event but may increase following wildland fire. The use of prescribed fire and of wildfire managed for multiple/resource objectives under the Proposed Action would provide long-term beneficial impacts to wildlife that may result from increased plant productivity, intermittent creation of new snags, and reduced incidence of intense wildfire. Further, over the long term, improvements to vegetation are expected to result in improved ecosystem functioning and increased habitat diversity. The use of prescribed burns and of wildfire under conditions specified in the Proposed Action would allow the staffs of the Kings Mountain Parks to more effectively control fire location, timing, and intensity. In this way, impacts to sensitive mammals could be avoided or minimized. The parks would adhere to a goal of limiting the amount of area burned in one year, which would ensure unburned areas and nearby refugio for wildlife in the parks each year.

Targeted herbicide application, such as foliar application to specific basal or foliar plant areas, would minimize chances for overspray and applying to non-target plants. Thus, mitigation measures, limited use, low-volume application of herbicide to specific basal or foliar plant areas, and following all labels would minimize chances for overspray and impacting non-target plants. In addition, herbicides commonly used for vegetation management (e.g., triclopyr [Garlon 4/Element 4], glyphosate, imazapyr, sulfometuron, metsulfuron methyl, hexazinone) have been designed to target biochemical processes unique to plants and have low levels of direct toxicity or risk to wildlife and fish species when used in accordance with label specifications (Tatum 2004). For example, past studies have noted the presence of rattlesnakes following herbicide application (Ulev 2008). Herbicides commonly used for vegetation management also degrade quickly upon entering the environment and are neither persistent nor bioaccumulate (Tatum 2004). Over time, using targeted herbicide as a follow-up treatment to reduce and/or maintain brush regrowth along fuel breaks or forest restoration would reduce and/or cease the need for repetitive mechanical work, thus minimizing reoccurring disturbances to special status species. Targeted herbicide is not likely to be used in rocky areas where dwarf juniper, Greenland sandwort, and the divided-leaf ragwort occur. Additionally, the acreages proposed for targeted herbicide application in the parks is expected to remain low (see Section 2.3.3).

Federally and State-listed Species

Impacts resulting from manual and mechanical treatment, prescribed fire, and wildland fire suppression would be similar to those described under the No Action Alternative—short-term, adverse and long-term, beneficial. Under the Proposed Action, up to 3,000 acres (about 12% of the entire Kings Mountain Parks' acreage) would undergo treatment by prescribed fire, wildfire managed for multiple/resource objectives, and mechanical treatments in any given year.

The primary difference between the No Action Alternative and the Proposed Action is the management of wildland fire for multiple/resource objectives. Wildfires would be allowed to burn and managed under specific conditions that would minimize adverse impacts to the northern long-eared bats and their habitats. The parks would also have greater flexibility to consider management of human-caused wildfires after the initial response to avoid resource damage, in accordance with NPS and state policies. Because the annual occurrence of wildfire within the parks is low, this change has only limited potential to cause additional impacts to federally listed bat species when compared to the No Action Alternative.

Because these management practices would result in wildfire burning in unplanned locations and seasons, this could impact the northern long-eared bat species, if present in the parks. To avoid adverse impacts to the greatest extent possible, the parks would implement the following mitigation measures for the northern long-eared bat listed in below in addition to those outlined in Section 2.6:

- After providing for public and firefighter safety, attempt to prevent any wildfire from burning to within 0.25 miles of a known hibernaculum
- After providing for public and firefighter safety, attempt to prevent any wildfire from burning to within 150 feet of a known maternity roost tree, if one is found in the park
- Contact the appropriate USFWS Ecological Services Office as soon as it is practical to do so in the event of any wildfire that burns within 0.25 miles of a known hibernaculum or 150 feet of a known occupied maternity roost tree, or that occurs during the maternity season (approximately April 1–August 15). Note: This procedure follows the “Emergency Consultation Process” as defined by USFWS.

Because the parks currently have no records of northern long-eared bat maternity roost trees, it is essential to use an adaptive management approach to implement the outlined mitigation measures. Future surveys or research in the parks may determine the presence of northern long-eared bats, maternity roost trees, and hibernacula. These surveys could provide information on locations and habitat use for this federally listed bat species. This information would then be used to determine necessary and specific mitigation measures during wildfires or proposed fuel treatments.

Cumulative Impacts

The past, present, and reasonably foreseeable future actions would be the same as described for the No Action Alternative. Cumulative impacts would be the same as described under the No Action Alternative with beneficial, minor, long-term, and localized due to improved habitat quality and maintained and/or restored fire-adapted vegetation communities. Adverse impacts would also be the same with short-term, localized impacts due to increased noise and disturbance to individual special status animal species and potential injury or mortality of individual special status plant species.

Section 7 Determination of Effect. Alternative B would have no effect on the Carolina heelsplitter because none have been documented in the parks, and mitigation measures would be implemented to avoid adverse impacts to water quality in the Catawba River watershed (includes Crowders Mountain State Park) resulting from planned fire management activities. Alternative B may affect but is not likely to adversely affect the northern long-eared bat because bat habitat could be improved through the use of fire, planned fire management activities would lead to a reduced risk of high-severity wildfire over time, and mitigation measures would be implemented to avoid adverse impacts resulting from fire management activities.

Alternative C—No Management of Wildfires for Resource Objectives

Impacts to special status species and their habitat would be the same as the Preferred Alternative; however, there would be no management of wildfires for multiple objectives that included resource objectives; wildfire management would be focused on suppression and protection objectives. This would result in less reduction of hazard fuels over time compared to the Preferred Alternative which could increase the probability of localized, high severity wildfires over time. This would produce increased potential for the elimination of tracts of forest with mature and large trees. This could result in reduced resilience and integrity of special status species and their habitat. Impacts to special status species and their habitat would be direct, adverse, short-to long-term, localized, and minor to moderate. The degree of impacts to special status species from wildfires would depend on the intensity, size, time of year, and duration.

However, the ability to use mechanical and herbicide would create more restored forest and less risk of high severity fire than activities allowed under the No Action Alternative.

Wildfires focused on suppression and protection objectives under Alternative C would slightly increase overall vegetation reduction due to more firefighter work along fire control lines created during some suppression incidents. During a suppression incident there would be more vehicle traffic that carry firefighters and equipment, which may require limited off road use that could lead to minor soil compaction and

temporary trampling of vegetation. MIST tactics would be used during wildfire suppression to minimize the impact of fire control actions to soils and vegetation, thus reducing potential adverse impacts.

The impacts to special status species habitat from fire suppression activities would be short-term, adverse, and negligible to moderate.

Cumulative Impacts

Impacts to Special Concern Species would be negligible to minor to moderate and beneficial long term. Alternative C would increase habitat for some fire-dependent species by mowing, and the chance of severe wildfire would be reduced due to thinning. Many species would not be impacted by this alternative except that they would benefit from reduced chance of wildfire. Habitat improvement and diversity would not be as successful compare to the Preferred Alternative.

Section 7 Determination of Effect. Alternative C would have no effect on the Carolina heelsplitter because none have been documented in the parks, and mitigation measures would be implemented to avoid adverse impacts to water quality in the Catawba River watershed (includes Crowders Mountain State Park) resulting from planned fire management activities. Alternative C may affect but is not likely to adversely affect the northern long-eared bat because bat habitat could be improved through the use of planned fire management activities, leading to a reduced risk of high-severity wildfire over time, and mitigation measures would be implemented to avoid adverse impacts resulting from fire management activities.

3.9 Archaeological and Historic Structure Resources

3.9.1 Affected Environment

The sudden rise of a patriot militia in September 1780, demonstrated the self-reliance, determination, and courage of early American backcountry settlers. Mountaineers from North and South Carolina, Virginia, present-day Tennessee, and Georgia assembled without official call and marched to defeat loyalist forces at the Battle of Kings Mountain on October 7, 1780. The initiative temporarily halted the British advance into North Carolina and was the first in a series of defeats that ultimately led to Lord Cornwallis's surrender at Yorktown. The National Military Park exists to preserve and protect the location of this pivotal battle of the Revolutionary War. As such, the area was nominated to the National Register of Historic Places (NRHP) in 1976 as a historic district. A historic district is "a geographically definable area, urban or rural, possessing a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united by past events or aesthetically by plan or physical development" (Little et al. 2000). The National Military Park Historic District was added to the NRHP in 1995.

Cultural resources within the boundaries of the National Military Park include archaeology, cultural landscapes, history, historic structures, and the museum collection and archives. Significant recent projects, such as an archival assessment and remote sensing archaeological surveys, have increased the ability of park staff to manage and preserve important cultural landscapes, historic structures, and museum and archival collections. In addition, because of the significance of the battle in the American Revolutionary War, much of the history of the battle and those who fought in it has been thoroughly researched and documented.

The National Military Park contains 29 historic structures. The historical significance of the landscape within the National Military Park is marked by evidence of 18th century farming and backcountry life in addition to the battlefield, monuments to fallen soldiers, a presidential address, and National Park Service management. The second oldest monument in the United States, erected in 1815, to Major William Chronicle stands on the Kings Mountain Battlefield.

The only historic structure in the park remaining from the time of the battle is the Colonial Road, which was the road the armies used to reach Kings Mountain prior to the battle. Historic structures commemorating the battle and its participants include the Centennial Monument erected to commemorate the 100th anniversary of

the battle and the U.S. Monument erected in 1909. Additional commemorative structures include but are not limited to markers indicating the locations where Major William Chronicle and Major Patrick Ferguson were thought to have fallen during battle; a marker commemorating President Hoover's visit to the battlefield; a marker commemorating Colonel Asbury Coward, who established the Kings Mountain Centennial Association; and markers commemorating Colonel Frederick Hambright and Lieutenant Colonel James Hawthorne, both Patriot commanders during the battle. Such structures are significant because they typify the war commemorative architecture and style of the late 19th and early 20th centuries; they are used to interpret the significance of the Battle of Kings Mountain in the commemorative period.

Additional historic structures relate to the National Park Service development of the park and Civilian Conservation Corps work in the park in the 1930s: the historic Yorkville-Shelbyville Road, redeveloped in 1938 as a fire road; the Main Park Road; stone rubble swales along the road; the superintendent's residence, now used as offices; the administration building; the parking lot at the park's headquarters; the stone headwalls along the Main Park Road; and the administration building flagstaff. The structures are prime examples of the Colonial Revival style of architecture the National Park Service used for buildings in the East because the rustic style, preferred in the West, did not blend well into the cultural landscapes of Eastern parks.

The remaining historic structures within the National Military Park are not directly related to the battle, its commemoration, or the development of the park. These include those structures within the Howser Homestead: the Howser House, the Howser Cemetery headstones, the Howser Road, and the Howser Terraces; as well as those structures that are part of the Morris Homestead: the Morris House, the Morris Shed, and the Gordon Cemetery headstones. Henry Howser constructed the Howser House in 1803, employing a unique Pennsylvanian-German style that is distinctly different from the typical Carolina backcountry architecture of the 19th century. The Howser House is an exceptional example of this type of architecture. In 1977 the Park Service restored the house to its appearance as recorded in 1900 in order to protect its historic significance and integrity. Park staff use the site periodically to host interpretive programs and living history demonstrations.

Archaeological evidence has shown that Kings Mountain has seen many stages of human activity across its forested slopes. Based on the presence of lithic artifacts in excavated stratified deposits, prehistoric occupation occurred as early as 4700 to 4300 B.C. However, the primary archaeological resources at the National Military Park are on the historic battlefield. Several possible burials from the battle of Kings Mountain were detected in close proximity to Major Chronicle and Major Ferguson's monuments, Civil War ammunition and a button were uncovered accidentally, and President Hoover's visit on October 7, 1930 left evidence of a one day road, comfort stations, and stages.

In addition to cultural landscapes and historic structures, the National Military Park also includes significant archaeological sites. The park's largest, most visible, and most visited archaeological site is the battlefield. The site is 600 yards long, ranges from 60 to 120 yards wide, and marks the location of a majority of the fighting during the Battle of Kings Mountain.

The KIMO staff use archaeological surveys to help re-create the battlefield scene and interpret it for visitors. In the most recent surveys of this area in 1999 and 2000, archaeologists found five clusters of artifacts, such as fired and unfired shot, indicating that while many of the historical accounts of the battle accurately portray troop positions and movements, the fighting actually extended beyond what park staff and historians previously thought. An extensive report on these excavations was published in 2006.

Twenty other archaeological sites have been recorded within the boundaries of the National Military Park. At this time, seven sites have treatment recommendations and only nine have been located using Global Positioning System coordinates. Most sites are only known through the location of visible site features and have little documentation. An archaeological survey and inventory of the entire 3,945 acres within the National Military Park has never been performed.

Although much of the land was ravaged and agricultural practices poor, these conditions helped to provide for the establishment of Kings Mountain State Park through the work of the Civilian Conservation Corps (CCC). Company 4479, CCC Camp SC SP-7 was organized on July 25, 1935, and was located near Camp Cherokee off Moton Road. Kings Mountain State Park has numerous facilities of historic significance. This includes all buildings, roads, lakes, and facilities built by the CCC that total 78 buildings.

Kings Mountain State Park currently has 78 structures that went on the National Historic Register as of March 2008. These buildings consist of the dining halls and cabins from each group camp as well as the bathhouse that overlooks Lake Crawford.

Other historical structures include the Dickey-Sherer home, which now serves as the park office, and most of the buildings on display at the Living History Farm. There are also additional historical and archaeological sites on the park. These sites include two graveyards off Apple Road and two CCC Camps off Moton Road. At least one Native American artifact has been discovered at Kings Mountain State Park but no real archaeological work has been done here. However, a complete survey needs to be finished in the future.

Cultural information was not available for Crowders Mountain State Park at the time of publication of this EA.

Section 106 consultation with the State Historic Preservation Offices is discussed in section 4.3.

3.9.2 Methodology and Intensity Threshold

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

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

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

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

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

Duration:

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

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

3.9.3 Environmental Consequences

Alternative A—No Action

Under this alternative, the fire management programs would include prescribed burning and wildfire suppression actions. The fire management staff at the Kings Mountain Parks coordinates with their cultural

resource staff and appropriate tribal groups to avoid known archaeological sites and historic structures. Resource protection measures in the current FMPs serve to provide long-term, beneficial impacts to archaeological and historic resources. Mowing around structures to maintain defensible space would continue as well as prescribed fires. Prescribed fires help to reduce hazard fuels, control non-native plant species, and maintain defensible space for archaeological resources and historic structures. Prescribed fire and mowing increase the potential for wildland fires to be localized, lower intensity, ground fires, which are easier to suppress/manage, thus reducing the potential risk of damage to archaeological sites and historic structures.

Prescribed fire would allow for advance clearance and mitigation activities at cultural sites and historic structures. Known archaeological and historic resources could be excluded from prescribed burn units or local site-specific related mitigation measures could be implemented. Prescribed burning would reduce the probability of severe wildfires, thus reducing the potential for damage to known and unknown archaeological and historic resources, thus enhancing protection. Standard management strategies would be adopted to preclude or minimize impacts. Should new archaeological resources be identified during prescribed burns, all work would cease in the immediate vicinity of the discovery until the resource could be identified and documented and an appropriate mitigation strategy developed in consultation with the State Historic Preservation Officer. Any known archaeological resources would be marked with special flagging and mitigation measures would be taken to protect identified resources from prescribed burns. Based upon current information, the Preferred Action Alternative impacts would be direct, minor to moderate, long-term, beneficial, and site-specific by helping to protect archaeological sites and historic structures.

In untreated areas, hazard fuels (i.e., brush density) would continue to increase, which could lead to the buildup of fuels in areas adjacent to archaeological and historic resources. This could lead to increased potential for intense wildfires that could have direct fire impacts on archaeological sites and/or historic structures. Potential for increased high intensity wildfire could result in the destruction of unknown, unrecorded, and known archaeological sites. Severe wildfire impacts include discoloration of surface artifacts, burning perishable materials, and chipping or cracking of rock and ceramic artifacts. Archeomagnetic dates and pollen counts could also be altered from a severe, uncontrollable wildfire. Depending on severity of the fire, historic structures could be degraded by charring of wooden structures or spalling of cement based structures, which appears as distinct lines or striations resulting in cracking, breaking, chipping, or craters on the surface (Ryan et al. 2012). This effect to archaeological sites and historic structures would be direct, long-term, minor to moderate, adverse, and localized due to potential fuel build up and the increased risk for severe wildfires.

Wildland fire suppression actions could result in direct, long-term, adverse, localized impacts due to displaced surface materials; exposure of materials due to ground disturbance; or disturbance to materials immediately below the surface by vehicles used due to earth moving or compaction. Indirect adverse impacts would include exposure of artifacts to erosion. Aerial use of retardant could discolor surface artifacts or structures. Indirect adverse impacts could include exposure of artifacts to erosion, which could increase looting. Implementation of mitigation measures with avoidance of known archeological sites and historic structures would result in adverse, localized, short-term, and minor impacts from fire suppression tactics.

Spot treatments to existing invasive (non-native) plants that may be found after wildfires or in disturbed areas would be a relatively minor use. Thus, impacts would be adverse and negligible to archaeological sites and historic structures.

Cumulative Impacts

Cumulative impacts to archeological and historic structure resources would occur from the No Action Alternative plus other activities including past development, park management activities, past logging activities and grazing, and natural erosion. The No Action Alternative would result in minor, long-term, adverse, localized impacts due to potential future severe wildfires from continued retention and accumulation

of brush density and ground fuels in untreated areas, including areas adjacent to archaeological and historic structure resources.

Alternative B—Preferred Alternative

Impacts to archaeological and historic resources would be similar to those described under the No Action Alternative with the spatial extent of beneficial and adverse impacts increasing with managing wildfires for multiple objectives including resource objectives. Unplanned fire management activities would have the potential for ground disturbance within and near archaeological and historic structure resources. However, wildfires managed for multiple objectives including resource objectives would have less impact on vegetation and soils than full suppression of wildfires.

The use of mechanical treatments to reduce hazard fuels and to create and/or maintain defensible space and fuel breaks could result in direct, long-term, adverse, localized impacts due to displaced surface materials; exposure of materials due to ground disturbance; or disturbance to materials immediately below the surface due to earth moving or compaction. Indirect adverse impacts would include exposure of artifacts to erosion, which could increase looting. Impacts from mechanical treatments would be localized, short-term, and minor with avoidance of known archeological resources and implementation of mitigation measures.

Managing wildfires for multiple objectives including resource objectives and utilizing mechanical treatments would increase the degree and range of protection for archeological sites and historic structures by further reducing hazard fuels within and adjacent to archaeological sites and historic structures and maintaining/creating defensible space and fuel breaks around and near archaeological sites as mowing currently occurs around buildings. These activities would result in long-term, beneficial, and minor to moderate impacts.

Targeted herbicide application applied by hand to specific basal or foliar plant areas would minimize chances for overspray and migration into the soil. In addition, targeted herbicide application would use herbicides that do not have short- or long-term residual implications to soils. Implementation of mitigation measures, limited use as a follow-up treatment to selected fuel breaks and defensible space treatments would also help to minimize impacts to archaeological sites and historic structures by minimizing vegetation cutting and ground disturbance. Thus, impacts would be adverse and negligible to archaeological sites and historic structures.

Cumulative Impacts

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

After applying the Advisory Council on Historic Preservation's criteria of adverse effect (36 CFR part 800.5, *Assessment of Adverse Effects*), the NPS concludes that implementation of Alternative B would generally result in no adverse effect on cultural resources. Concurrence will be sought from the South Carolina State Historic Preservation Office.

Alternative C—No Management of Wildfire for Resource Objectives

Impacts to archaeological and historic resources would be similar to those described under the Preferred Alternative; however, wildfires would be managed for multiple objectives, excluding resource objectives under this alternative. In general, full suppression efforts do not allow for as much pre-planning as prescribed burns in planning for protection of elements. However, the vegetation management techniques should increase the likelihood of fires being localized, lower intensity ground fires. There is still potential for increased high intensity wildfire in untreated areas that could result in the destruction of unknown,

unrecorded, and known archaeological sites. Severe wildfire impacts include discoloration of surface artifacts, burning perishable materials, and chipping or cracking of rock and ceramic artifacts. Archeomagnetic dates and pollen counts could also be altered from a severe, uncontrollable wildfire. Depending on severity of the fire, historic structures could be degraded by charring of wooden structures or spalling of cement based structures, which appears as distinct lines or striations resulting in cracking, breaking, chipping, or craters on the surface (Ryan et al. 2012). This effect to archaeological and historic structure resources would be direct, long-term, minor, adverse, and localized due to potential fuel build up and the increased risk for localized, severe wildfires. The degree of impacts would vary depending on size of the fire, the location, extent, timing, and other factors related to the fire.

Cumulative Impacts

Over all cumulative impacts to archeological and historic structure resources from Alternative C in combination with past, present, and reasonably foreseeable future actions would be minor to moderate, long-term, beneficial, and site-specific as well as long-term, adverse, and minor.

3.10 Cultural Landscapes

Cultural landscapes are “a reflection of human adaptation and use of natural resources and is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and types of structures that are built. The character of a cultural landscape is defined both by physical materials, such as roads, buildings, walls, and vegetation, and by use reflecting cultural values and traditions (DO-28).”

3.10.1 Affected Environment

The cultural landscape in the National Military Park exhibits strong integrity to three historic periods: the battle of Kings Mountain, the Commemorative Period following the battle, and the NPS Park Development Period. The nomination of the National Military Park to the National Register was amended in 1994 to include additional landscape features associated with the three periods of significance (Vincent 2003). The Battle of Kings Mountain took place October 7, 1780 on Battlefield Ridge, a cleared area with wooded slopes, between American militia and Loyalist supporters. The battlefield commemoration (1815–1931) occurred on a central forty acres of the ridge with monuments and markers locating key sites from the battle. The Park Development era (1933–1942) includes the National Park Service design of the nearby museum area.

Two component landscapes are identified: The Goforth-Morris Norman and Howser farmsteads (NPS 2010). Within the National Military Park boundaries, these two component landscapes post-date the battle but signify the historic agricultural land use and architecture of the region. The smaller component landscape, the Goforth-Morris Norman Farmstead, is within the Howser farm boundaries and includes features clustered around a one-story farmhouse (NPS 2010). The Howser farmstead is located on Howser Road in the northwest section of the park. A German-influence stone house once occupied by the Howser family survives with additional landscape features.

Treatment recommendations for Battleground Ridge include rehabilitating the natural/cultural landscape by re-establishing the ridge top’s open space and historic views (Vincent 2003).

3.10.2 Methodology and Intensity Threshold

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

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

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

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

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

Duration:

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

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

3.10.3 Environmental Consequences

Alternative A—No Action

Under this alternative, the Kings Mountain Parks' fire management programs would continue to operate as they have with full suppression of wildfires, prescribed burning, mowing of grass areas, and spot treating invasive vegetation with handheld herbicide applications. Prescribed burning, mowing, and targeted herbicide application would allow for advance clearance and avoidance and mitigation activities in cultural landscapes. Prescribed fires would reduce hazard fuels and be designed to enhance/maintain the cultural landscape (e.g., maintaining more open forests, improving and creating defensible space around structures) without creating bare areas that would conflict with maintaining cultural landscape integrity and aesthetics. Because the hazard fuel reduction treatments would be planned, the impacts to the cultural landscape would be negligible to minor adverse effects on cultural landscape vegetation characteristics around archaeological sites and historic structures. These effects could consist of minor vegetation removal to more intense removal of shrubs to reduce dense stands around archaeological sites/historic structures in an effort to create and/or maintain defensible space (promotes less intense burning in wildfires). Any known archaeological resources would be marked with special flagging and mitigation measures would be taken to protect identified resources from prescribed burns. Based upon current information, the Preferred Alternative impacts would be direct, minor to moderate, long-term, beneficial, and site-specific by helping to maintain cultural landscapes.

Accumulation and retention of hazard fuels would continue in untreated areas within and adjacent to cultural landscapes, which could hinder restoration and maintenance of cultural landscapes. The potential for localized, intense wildfires that could remove large tracts of vegetation would increase in untreated areas. Effects to the cultural landscapes could be adverse, minor, localized, and long-term due to increased potential for locally severe fire effects on vegetation, which could lead to cultural landscapes not being representative of the three time periods of cultural significance. Impacts on contributing elements of the cultural landscape would be the same as discussed in the Archaeological and Historic Structure Resource Section. The degree of impacts would depend on the intensity, duration, location, and size of the wildfire.

Wildland fire suppression actions and tactics would consider type and location of contributing elements to the cultural landscapes. Most emergency management actions for fires will allow for protection of contributing elements to the cultural landscape (archaeological sites, historic structures). There is potential for emergency management responses for wildfires to adversely impact contributing elements of the cultural landscape. Fires or damage from suppression activities could result in unacceptable changes to character-defining elements of historic districts or structures. Fires could also remove important landscape elements, structures or historic sites, and create large amounts of unsightly burned and scorched vegetation, and un-vegetated areas from fire lines and or intense burning, diminishing the visual integrity of the cultural landscape. The No Action Alternative could also lead to reduced integrity of the cultural landscape, as brush and small trees continue to increase in density compared to the historic period that represents the cultural landscape. The State Historic Preservation Officer will be notified of management responses to unplanned wildland fires.

Cumulative Impacts

Cumulative impacts to cultural landscapes would occur from the No Action Alternative plus other activities including past development, park management activities, fire management activities planned by other agencies, and wildfires originating from adjacent lands. The No Action Alternative in combination with the past, present, and foreseeable future actions would result in both beneficial and adverse cumulative impacts. Beneficial impacts would be moderate, long-term, and localized due to decreased hazard fuels (brush density and small trees) throughout the cultural landscape, which reduces the potential for large, intense wildfires. Adverse cumulative impacts to cultural landscapes would be minor, long-term, and localized due to increased risk for large, intense wildfires in untreated areas within and adjacent to the cultural landscape and associated vegetation loss and soil or ground disturbance.

Alternative B—Preferred Alternative

Impacts to cultural landscapes under the Preferred Alternative would be similar as described in the No Action Alternative; however, wildfires managed for multiple objectives including resource objectives, mechanical treatments to reduce hazard fuels, and targeted herbicide application, as a follow up to mechanical treatments would be allowed. The use of additional vegetation/fuel management tools would increase the ability and efficiency to reduce hazard fuels and to maintain/create fuel breaks and defensible space, thus increasing the protection and maintenance of the cultural landscape and its contributing elements. The potential for localized, lower intensity ground fires, which are easier to manage/suppress, would increase, thus reducing the potential risk of damage to cultural landscapes and associated historic resources. Lower intensity ground fires may help to maintain more open cultural landscapes representative of the historic period, and increase abundance of native plants found in the area during the historic period. Creating a more natural fire regime would favor native plants and reduce competition from invasive plants. Impacts to the cultural landscape under the Preferred Alternative would be both beneficial and adverse. Impacts to cultural landscapes under the Preferred Alternative would be minor to moderate, beneficial, long-term, and localized due to further reducing the potential for future severe wildfires as hazard fuels decrease and defensible space is maintained and/or created. Minor, long-term, adverse impacts could occur from inadvertent damage to resources while implementing planned fuel reduction projects, or from emergency management response to unplanned wildland fire.

Wildfires managed for multiple objectives including resource objectives would have prescriptive elements such as avoiding managing fires for resource benefit during periods of high fire danger, thus avoiding the larger, intense fires that may become characteristic under the No Action Alternative. Managing wildfires for resource objectives and the use of mechanical treatments would increase the degree and range of protection for the cultural landscape and its contributing elements by reducing hazard fuels adjacent to the cultural landscape, increasing the ability to achieve desired resource conditions, and maintaining/creating defensible space and fuel breaks around and near contributing elements to the cultural landscape. These activities would result in long-term, beneficial, and minor to moderate impacts.

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

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

Cumulative Impacts

Cumulative impacts to cultural landscapes from past, present, and reasonably foreseeable actions are similar to those described under the No Action Alternative with long-term, negligible to minor, adverse impacts. The

Preferred Alternative in combination with the past, present, and reasonably foreseeable future actions would result in adverse, long-term, minor cumulative impacts to cultural landscapes.

Alternative C—No Management of Wildfires for Resource Objectives

Cultural landscape impacts under this alternative would be similar as described under the Preferred Alternative; however, there would be no management of wildfire for multiple objectives including resource objectives. This would make reduction of hazard fuels less effective and more problematic, likely leading to higher and more intense wildfires harder to manage/suppress, compared to the Preferred Alternative. Due to continued fuel build up, the potential for more intense and larger wildfires would increase, which could increase the potential risk of damage by severe wildfires to cultural landscapes and associated historic resources. The degree of impacts would vary depending on size of the fire, the location, extent, timing, and other factors related to the fire. Impacts would be adverse, minor, long-term, site-specific and localized.

Cumulative Impacts

Cumulative effects to cultural landscapes would result from actions described under this alternative, plus other disturbances from measures taken by neighboring landowners to reduce hazard fuels. This alternative would have an increased potential for large and intense wildfires burning cultural landscapes. Associated fire-suppression activities such as vegetation cutting, clearing, and altering (e.g., dozer use, hand line construction, burnouts) would be more likely to alter the cultural landscape. Cumulative impacts to cultural landscapes under this alternative would be direct, minor, long-term, adverse, and localized.

3.11 Visitor use and Experience

3.11.1 Affected Environment

All three parks have primary objectives to provide appropriate visitor experiences and recreation opportunities. Since 2000, the National Military Park has averaged 266,759 annual visitors (NPCA 2010) and Crowders Mountain State Park now sees over a half million visitors each year (CMSP 2010). Visitation to Kings Mountain State Park remains high with over 700,000 visitors in 1997 (KMSP 2014). Visitors come to the parks to recreate, hike the picturesque trails, observe wildlife, and tour the historic sites, which includes learning about the area's role in the Revolutionary War and pioneer settlement activities.

The National Military Park has a newly renovated visitor center/museum with state of the art exhibits. The museum is designed to replicate an old growth forest, with several trees talking as they tell the story of the battle and the people involved, with many artifacts displayed throughout the museum. There is a 1.5-mile self-guiding walking trail that allows the visitor to see both perspectives of the battlefield starting below the northern slope of the ridge where a portion of the Patriot forces assaulted the ridge top. The trail turns back across the ridge where the Loyalists forces surrendered. Wayside exhibits around the trail highlight battle events. The Centennial Monument, U.S. Monument and Ferguson's Grave are key features along the trail. The National Military Park also has 16 miles of foot and equine trails that connect with the state parks.

Camping at the National Military Park is only allowed at backcountry Garner Creek Campsite that requires a three-mile hike to access. Additional camping is available at both state parks. Visitors to the park also come to view birds including highflying hawks and vultures, best seen from Browns Mountain. Trails also lead to lower, larger streams with various wood warblers nearby.

Crowders Mountain State Park offer visitors opportunities for overnight camping, hiking, picnicking, rock-climbing, and limited water sports. The visitor center includes natural history exhibits and highlights the importance of fire in the park's natural systems. Park rangers hold regularly scheduled educational and interpretive programs. Educational materials about Crowders Mountain State Park have been developed for grades 5-7 and are correlated to North Carolina's competency-based curriculum in science, social studies, mathematics and English/language arts. The Crowders Mountain State Park program introduces students to

basic geologic concepts, including the rock cycle, rock and mineral identification, weathering and erosion, and resource use.

Kings Mountain State Park offers visitor many miles of hiking trails, equestrian facilities, camping, a Living History Farm, and two fishing lakes. Kings Mountain State Park has 11 different hiking trails of various lengths and strenuous levels including hikes that connect with the other parks.

3.11.2 Methodology and Intensity Threshold

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

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

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

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

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

Duration:

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

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

3.11.3 Environmental Consequences

Alternative A—No Action

Under this alternative, the current fire management programs would continue with the each park managing fires and vegetation according to their management directives. There would be temporary visitor restrictions where vegetation/fuel treatments were occurring to ensure visitor safety. In the short-tem, the temporary restrictions would negatively impact the visitor experience of those people who are prevented from accessing the area. However, areas adjacent to the closures would still be open to visitor use and would have similar resources available. Noise associated with mechanical tools such as chainsaws or masticators could also temporarily disrupt the visitor experience.

Wildfires and prescribed fires could produce smoke altering or obstructing scenic views, odors, and the presence of blackened areas, which could affect some visitor experiences. These impacts would be adverse, localized, short-term, and negligible to moderate. The presence of fire, smoke, and blackened areas could provide educational opportunities for interpretation of natural processes or restoration of cultural landscapes, which may provide a beneficial, minor, and long-term impact.

In untreated areas, hazard fuels (brush, small trees, ladder fuels) would likely continue to accumulate, leading to increased potential for severe and intense wildfires. These wildfires could require more frequent public use restrictions as increased suppression efforts and smoke emissions would negatively impact the experience of visitors using the parks or surrounding lands. This increased potential for severe and intense wildfires and

associated suppression actions in untreated areas would be short- to long-term, minor to moderate, adverse, and localized. The degree of impacts would depend on fire attributes such as the location, size, intensity, duration, fuel type, and time of year.

Overall, this alternative would have direct, short-term, negligible to moderate, adverse impacts in the immediate area of treatment during the treatment period and is expected to have indirect, minor to moderate, beneficial, long-term, localized impacts.

Cumulative Impacts

Cumulative impacts to visitor use and experience under the No Action Alternative would be adverse, long-term, and minor due to increased potential for severe and intense wildfires as brush density and ground cover continue to increase. This would also result in increased potential for public use closures or smoke impacts due to wildfires and associated suppression activities. There would also be beneficial, long-term cumulative impacts to visitor use and experience as visitation during fire management activities may provide the opportunity to learn about the fire-adapted ecosystems and the importance of fire in resource management.

Alternative B—Preferred Alternative

Impacts from the Preferred Alternative would be similar to those described under the No Action Alternative with the spatial extent of adverse and beneficial impacts increasing as wildfires managed for multiple objectives including resource objectives, mechanical treatments, and additional targeted herbicide application would be allowed. The use of additional vegetation management tools would increase the ability and efficiency to reduce brush and small tree ground cover density; maintain and create defensible space and fuel breaks; and reintroduce fire as a natural ecological process. This would result in the increased success rate of ecological restoration efforts to fire-adapted ecosystems and other unique habitats by opening the mid-story and ground cover vegetation layers. Increased ecological restoration would increase the probability for lower intensity ground fires that are easier to manage and/or suppress and increase growth and germination of native herbaceous plant communities (grasses, forbs, and wildflowers), which would support native wildlife species. As bird and wildlife watching is a popular recreation activity in the parks, the perpetuation of native vegetation communities and native wildlife would enhance native bird and wildlife species, thus enhancing the visitor experience. In general, the additional vegetation management tools in combination with prescribed fire will lead to a more diverse, resilient, and natural area, with less human disturbance, which would be more aesthetically enticing to visitors.

There would be temporary visitor use restrictions in various sections of the parks to protect visitors where vegetation management actions are actively being applied (i.e., prescribed burns and wildfires managed for multiple objectives including resource objectives, mechanical treatments, and herbicide application). In the short-term, such restrictions would negatively affect the visitor experience of those people who are prevented from accessing the area. However, areas adjacent to the closures would still be open to visitor use and would have similar resources available.

Overall, this alternative would have direct, short-term negligible adverse impacts in the immediate area of treatment during the treatment period and is expected to have direct, minor to moderate, beneficial, long-term, localized impacts by minimizing the potential for future severe wildfires as the amount of area restored increases and fuel hazard reduction increases (i.e., dense brush and ground cover).

Cumulative Impacts

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

Alternative C—No Management of Wildfires for Resource Objectives

Visitor use and experience impacts under this alternative would be similar to the Preferred Alternative; however, no wildfires managed for multiple objectives including resource objectives would be allowed. This would make reduction of hazard fuels somewhat less effective over time in the parks, likely leading to higher and more intense wildfires harder to manage/suppress within and adjacent to the parks, compared to the Preferred Alternative. Due to potential fuel build up, the potential for more intense and larger wildfires would be higher and could require more frequent public use restrictions while fires are being suppressed and smoke generated by those fires would negatively impact the experience of visitors using other areas of the parks or surrounding lands. Natural and cultural resources could be degraded by stand replacing fire, which would degrade the park visitor experience. The degree of impacts would vary depending on size of wildfires, the location, extent, timing, and other factors related to the fire. Impacts would be adverse, negligible to minor, short- to long-term, and localized.

Cumulative Impacts

Cumulative impacts of Alternative C would be similar to cumulative impacts for the Preferred Alternative with short-term, adverse, and negligible to minor impacts as well as beneficial, long-term, minor cumulative impacts to visitor use and experience.

CHAPTER 4 CONSULTATION AND COORDINATION

4.1 Internal Scoping

Scoping is a process to identify the affected environment that may be impacted by the proposed project, and to explore possible alternative ways of achieving the proposal, while minimizing potential adverse impacts. Internal Scoping was conducted in September 2014 by an interdisciplinary team of professionals from the National Military Park, Kings Mountain State Park, and the NPS Southeast Regional Office including representatives from fire management, resource management, NEPA specialists, and the private contractor working on the EA. The interdisciplinary team discussed the purpose and need for the project, discussed potential alternatives to address these needs, did preliminary determination of potential environmental impacts, and discussed past, present, and foreseeable projects that may have cumulative effects, and potential mitigation measures. The team members also conducted a site visit to view and evaluate the existing conditions of cultural and natural resources and hazard fuels.

4.2 External Scoping

External scoping was conducted to inform the public about the proposal to implement an interagency FMP for the Kings Mountain Parks and to generate input on the preparation of this EA. This effort was initiated by distributing a scoping letter dated December 1, 2014 to various stakeholders describing the project and asking for comments (Appendix A). In addition, the letter was posted on the PEPC website and made available at the visitor center. A press release was also sent to local and regional media and posted on the park website. The public was given 30 days to comment on the project.

An open house style meeting was held to inform the public and various agencies about the proposed interagency FMP, and to solicit feedback for direction in this EA. The public meeting was held on December 9, 2014 at the National Military Park visitor center. During the meeting, representatives from the Kings Mountain Parks were available to present an overview of the proposed action, discuss issues, and answer question. Stakeholders, neighbors, and other interested persons were invited to submit oral and written comments or write in letters, depending on their preference.

4.3 Agency Consultation

In accordance with the Endangered Species Act, the Kings Mountain Parks consulted the USFWS with regards to federally listed species. A copy of the EA will be sent to the USFWS for review along with a request for their concurrence with the determination of effects on federally listed species.

In accordance with Section 106 of the NHPA, as amended in 1992 (16 USC 470 *et. seq.*), the Kings Mountain Parks contacted the South Carolina and North Carolina State Historic Preservation Offices (SHPO) by letter dated November 21, 2014 during the public scoping period asking for information concerning cultural resources. A copy of this EA will be sent to North and South Carolina SHPOs for review and comment.

4.4 American Indian Consultation

The affiliated American Indian tribes were contacted by scoping letter dated November 21, 2014 informing them of the proposed action and soliciting comments. Information from the tribes also was requested to determine if any ethnographic resources are in the project area and if the tribe wanted to be involved in the environmental compliance process. As of the date of this EA, no comments were received. The American Indian Tribes that are traditionally associated with the lands of the Kings Mountain Parks will have an opportunity to review and comment on this EA.

4.5 Environmental Assessment Review

The EA is subject to a 30-day public comment period. To inform the public of the availability of the EA, NPS will publish and distribute a letter to various agencies, tribes, and the mailing list, as well as place an ad in the local newspaper. The document will be available for review on the PEPC website at <http://parkplanning.nps.gov/NationalMilitaryPark> and at each park's visitor center. Copies of the EA will be provided to interested individuals, upon request.

During the 30-day public review period, the public is encouraged to submit their written comments to NPS, as described in the instructions at the beginning of this document. Following the close of the comment period, all public comments will be reviewed and analyzed, prior to the release of a decision document. The Kings Mountain Parks will issue responses to substantive comments received during the public comment period, and will make appropriate changes to the EA, as needed.

4.6 List of Preparers

Park Staff

Melissa Forder, Deputy Regional Fire Management Officer, Southeastern Regional Office, NPS

Jami Hammond, NEPA Planner, Southeast Regional Office, NPS

Larry Hyde, Crowders Mountain State Park Superintendent

Shea Joyner, Kings Mountain State Park Manager

Rob Klein, Southern Appalachians Fire Ecologist

Tim Pinion, Wildlife Biologist and Endangered Species Coordinator, Southeastern Regional Office, NPS

Chris Revels, Kings Mountain National Military Park Chief Ranger

Ecosystem Management, Inc. Staff

Matt Brooks, Wildlife Biologist

Paul Clarke, Vegetation Ecologist

Stephanie Lee, NEPA Specialist

Bob Lineback, Wildland Fire Specialist

Mike Tremble, Project Manager

Kate Wright, Cultural Specialist

CHAPTER 5 REFERENCES

Executive Orders

Executive Order 11988 (Floodplain Management)

Executive Order 11990 (Protection of Wetlands)

Executive Order 12898 (Environmental Justice in Minority Populations and Low-income Populations)

Executive Order 13007 (Indian sacred sites)

NPS Director's Orders

DO-12 Conservation Planning, Environmental Impact Analysis and Decision Making

DO-18 Wildland Fire Management

DO-24 Museum Collections

DO-28 Cultural Resource Management

DO-47 Sound Preservation and Noise Management

DO-77 Natural Resources Management Guideline (NPS-77)

DO-77-1 Wetland Protection

DO-77-2 Floodplain Management

Federal Government

36 CFR Parks, Forests, and Public Property

40 CFR Protection of Environment

50 CFR Wildlife and Fisheries

1916 Organic Act

1963 Clean Air Act, as amended

1964 Wilderness Act

1966 National Historic Preservation Act

1969 National Environmental Policy Act

1970 General Authorities Act

1972 Clean Water Act

1973 Endangered Species Act

1979 Archeological Resources Protection Act

1981 Farmland Protection Policy Act

1993 Government Performance Results Act

Secretarial Order No. 3175—Departmental Responsibilities for Indian Trust Resources

CHAPTER 6 LITERATURE CITED

- Carey, J. H. 1994. *Thermopsis mollis* in Fire Effects Information System. U.S. Department of Agriculture Forest Service Rocky Mountain Research Station Fire Sciences Laboratory. Online: <http://www.fs.fed.us/database/feis/>.
- Chafin, L. 2008. Georgia Department of Natural Resources Wildlife Resources Division Rare Plant Species Profiles: *Symphyotrichum georgianum*. Online: <http://georgiawildlife.com/sites/default/files>.
- Crowders Mountain State Park State Park. 2010. Crowders Mountain State Park State Park General Management Plan. N.C. Department of Environment and Natural Resources Division of Parks and Recreation Kings Mountain, North Carolina.
- Curtis, O. E., R. N. Rosenfield, and J. Bielefeldt. 2006. Cooper's Hawk (*Accipiter cooperii*), The Birds of North America Online (A. Poole, Ed.). Cornell Lab of Ornithology, Ithaca, NY. Online: <http://bna.birds.cornell.edu/bna/species/075doi:10.2173/bna.75>.
- DeVivo, J.C., C. J. Wright, M. W. Byrne, E. DiDonato, and T. Curtis. 2008. Vital Signs Monitoring in the Southeast Coast Inventory & Monitoring Network. Natural Resource Report NPS/SECN/NRR—2008/061. National Park Service, Fort Collins, Colorado.
- Environmental Protection Agency [EPA]. 1998. EPA's Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analyses. U.S. Environmental Protection Agency (EPA). Accessed January 2015 from <http://www.epa.gov/environmental>.
- _____. 2015. The Green Book Nonattainment Areas for Criteria Pollutants. Accessed August 2015 from <http://www.epa.gov/airquality/greenbook/>.
- Fisichelli N.A., S.R. Abella, M. Peters, and F.J. Krist Jr. 2014. Climate, Trees, Pests, and Weeds: Change, Uncertainty, and Biotic Stressors in Eastern U.S. National Park Forests. *Forest Ecology and Management* 327:31–39.
- Flood Emergency Management Agency [FEMA]. 2015. National Flood Hazard Layer. Accessed August 2, 2015. Federal Emergency Management Administration. <https://msc.fema.gov/portal/search>.
- Florida A&M University. 2006. *Kings Mountain National Military Park Vegetation Management Plan*, Prepared for the National Park Service Contract no. H5000010593, Florida A&M University Laboratory for Remote Sensing and Spatial Analysis Division of Agricultural Sciences, March, 2006.
- Frost, C.C. 1998. Presettlement fire frequency regimes of the United States: a first approximation. Pages 70–81 in Theresa L. Pruden and Leonard A. Brennan (eds.). *Fire in ecosystem management: shifting the paradigm from suppression to prescription*. Tall Timbers Fire Ecology Conference Proceedings, No. 20. Tall Timbers Research Station, Tallahassee, FL.
- _____. 2014. Landscape Ecologist, Personal communication. September 16–17, 2014. Presentation at Kings Mountain Parks Fire Management Plan Environmental Assessment kick-off meeting.
- _____ and J. Shedd. 2015. Historic fire regimes and pre-European settlement vegetation of the Kings Mountain Region. Unpublished report for Kings Mountain National Military Park.
- Greenberg, C. H., A. L. Tomcho, J. D. Lanham, T. A. Waldrop, J. Tomcho, R. J. Phillips, and D. Simon. 2007. Short-term Effects of Fire and Other Fuel Reduction Treatments on Breeding Birds in a Southern Appalachian Upland Hardwood Forest. *Journal of Wildlife Management* 71:1906–1916.

- _____ and T. A. Waldrop. 2008. Short-term Response of Reptiles and Amphibians to Prescribed Fire and Mechanical Fuel Reduction in a Southern Appalachian Upland Hardwood Forest. *Forest Ecology and Management* 255:2883–2893.
- Gucker, C. L. 2006. *Quercus ilicifolia* in Fire Effects Information System. U.S. Department of Agriculture Forest Service Rocky Mountain Research Station Fire Sciences Laboratory. Accessed June 2015 from <http://www.fs.fed.us/database/feis/>.
- Johnson, J. B., J. W. Edwards, W. M. Ford, and J. E. Gates. 2009. Roost Tree Selection by Northern Myotis (*Myotis septentrionalis*) Maternity Colonies Following Prescribed Fire in a Central Appalachian Mountains Hardwood Forest. *Forest Ecology and Management* 258:233–242.
- Johnson, J. B., W. M. Ford, and J. W. Edwards. 2012. Roost Networks of Northern Myotis (*Myotis septentrionalis*) in a Managed Landscape. *Forest Ecology and Management* 266:223–231.
- Karr, J.R. and I. Schlosser. 1978. Water Resources and the Land-Water Interface. *Science* 201: 229–234.
- Keyser, P. D., and W. M. Ford. 2005. Influence of Fire on Mammals in Eastern Oak Forests. Proceedings of Fire in Eastern Oak Forests: Delivering Science to Land Managers. GTR-NRS-P-1.
- Kilpatrick, E. S., D. B. Kubacz, D. C. Guynn Jr., J. D. Lanham, and T. A. Waldrop. 2004. The Effects of Prescribed Burning and Thinning on Herpetofauna and Small Mammals in the Upper Piedmont of South Carolina: Preliminary Results of the National Fire and Fire Surrogate Study. GTR SRS-71 U.S. Department of Agriculture Forest Service Southern Research Station, Asheville, NC.
- Kings Mountain State Park. 2014. Kings Mountain State Park General Management Plan. Blacksburg, South Carolina.
- Lacki, M. J., D. R. Cox, L. E. Dodd, and M. B. Dickinson. 2009. Response of Northern Bats (*Myotis septentrionalis*) to Prescribed Fires in Eastern Kentucky Forests. *Journal of Mammalogy* 90:1165–1175.
- Landrum, J.B.O. 1897. Colonial and Revolutionary History of Upper South Carolina. Shannon and Co. Printers and Binders. Greenville, S.C.
- Little, B., E.M. Seibert, J. Townsend, J.H. Sprinkle, Jr., and J. Knoerl. 2000. Guidelines for Evaluating and Registering Archeological Properties Bulletin. Available on line at <http://www.nps.gov/nr/publications/bulletins/arch/>.
- Lowrance, R., R. Leonard, and J. Sheridan. 1985. Managing Riparian Ecosystems to Control Non-point Pollution. *Journal of Soil and Water Conservation* 55:87-91.
- McMahon and Bush. 1991. No Herbicide Residues Found in Smoke from Prescribed Fires. USDA Forest Service, R8-MB 56, Atlanta, Georgia.
- Meadows, A., and J.D. Wilson. 2015. Pigmy Rattlesnake (*Sistrurus miliarius*). Savannah River Ecology Laboratory. Accessed July 2015 from <http://srelherp.uga.edu/snakes/sisnil.htm>.
- Miller, James H. 2000. The Exotic Plant Problem: Defending Your Lands from an Unfriendly Takeover.
- Moore, B. J. 2009. An evaluation of biological inventory data collected at Kings Mountain National Military Park: Vertebrate and vascular plant inventories. Natural Resource Report NPS/CUPN/NRR—2009/165. National Park Service, Fort Collins, Colorado.

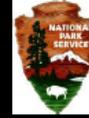
- Morgan, K.L., T.H. Roberts, and M.S. Peterson. 2003. Development of a Geo-referenced Database to Identify and Inventory Wetlands at Kings Mountain National Military Park. Tennessee Technological University. Department of Biology. Cookeville, TN, September 2003.
- Naiman, R.J., and H. Decamps. 1997. The ecology of interfaces—riparian zones. *Annual Review of Ecology and Systematics* 28:621-658
- National Interagency Fire Center [NIFC]. 2015. Interagency Standards for Fire and Fire Aviation Operations. Boise, ID. http://www.nifc.gov/policies/pol_ref_redbook.html.
- National Parks Conservation Association [NPCA]. 2010. State of the Parks, Kings Mountain National Military Park: A Resource Assessment. National Parks Conservation Assessment. June 2010.
- National Park Service [NPS]. 1999. Fire Management Plan, Kings Mountain National Military Park, Cherokee and York Counties. National Park Service. October 1999.
- _____. 2000. Finding of No Significant Impact on Environmental Assessment for the Fire Management Plan, Kings Mountain National Military Park, SC.
- _____. 2006. Management Policies 2006. U.S. Department of the Interior, National Park Service.
- _____. 2007. Weather and Climate Inventory. National Park Service Southeast Coast Network. Natural Resource Technical Report NPS/SECN/NRTR—2007/010. Fort Collins, Colorado.
- _____. 2008. Director’s Order #18: Wildland Fire Management. Available online at: <http://www.nps.gov/policy/Dorders/DO-18.html>.
- _____. 2009. Air Quality in National Parks. 2009 Annual Performance and Progress Report. Natural Resource Report NPS/NRPC/ARD/NRR—2010/266. Natural Resource Program Center, Air Resources Division, Denver, Colorado.
- _____. 2010. The Howser Farmstead, Kings Mountain National Military Park. The National Parks, Cultural Landscapes Inventory.
- _____. 2011. Director’s Order 12: Conservation Planning, Environmental Impact Analysis, and Decision-making. Available online at <http://www.nps.gov/policy/DOrders/DO-12.pdf>.
- _____. 2012a. Kings Mountain National Military Park Resources Stewardship Strategy. Kings Mountain National Military Park, Blacksburg, SC. National Park Service.
- _____. 2012b. Natural Resources Condition Assessment for Kings Mountain National Military Park. Contract: NPS/NATIONAL MILITARY PARK/NRR-2012/522. Kings Mountain National Military Park, Blacksburg, SC. National Park Service.
- _____. 2013. Climate Change Trends for the State of the Park Report, Kings Mountain National Military Park, South Carolina. Prepared by Nicholas Fisichelli, NPS Climate Change Response Program. August 20, 2013.
- _____. 2014a. Climate Change Resource Brief: Recent Climate Change Exposure of Kings Mountain National Military Park. U.S. National Park Service. July 2014.
- _____. 2014b. NPS Certified Species List for Kings Mountain National Military Park. Accessed September 2014 from <https://irma.nps.gov/App/Species/Search>.

- _____. Kings Mountain National Military Park, General Management Plan, draft (no date). Kings Mountain National Military Park, Blacksburg, SC, National Park Service.
- North Carolina Division of Water Resources [NCDWR]. 2004. Total Maximum Daily Load for Fecal Coliform for Crowders Creek North Carolina and South Carolina. North Carolina Department of Water Quality.
- Owen, W and H. Brown. 2005. Effects of Fire on Rare Plants. *Fire Management Today* 65:13
- Perry, R. W. 2012. A Review of Fire Effects on Bats and Bat Habitat in the Eastern Oaks Region. Proceedings of the 4th Fire in Eastern Oak Forests Conference. General Technical Report GTR-NRS-P-102.
- Phillips, R. J., and T. A. Waldrop. 2008. Changes in Vegetation Structure and Composition in Response to Fuel Reduction Treatments in the South Carolina Piedmont. *Forest Ecology and Management* 255:3107–3116.
- Redmon, L. A., and T. G. Bidwell. 2003. Management Strategies for Rangeland and Introduced Pastures. Oklahoma Cooperative Extension Service, Division of Agricultural Sciences and Natural Resources.
- Ryan, K.C., A.T. Jones, C.L. Koerner, and K.M. Lee. 2012. Wildland fire in ecosystems: Effects of fire on cultural resources and archaeology. General Technical Report RMRS-GTR-42-3. USDA Forest Service, Rocky Mountain Research Station, Fort Collins, Colorado.
- Shafer, S. L., P. J. Bartlein, and R. S. Thompson. 2001. Potential Changes in Distributions of Western North America Tree and Shrub Taxa under Future Climate Scenarios. *Ecosystems* 4:200–215.
- South Carolina State Park Service. 2009. Fire Management Manual. South Carolina Department of Parks, Recreation, and Tourism, Columbia, SC.
- Sullivan, J. 1994. *Accipiter striatus* in Fire Effects Information System. U.S. Department of Agriculture Forest Service Rocky Mountain Research Station Fire Sciences Laboratory Online: <http://www.fs.fed.us/database/feis/>.
- Tatum, V.L. 2004. Toxicity, Transport, and Fate of Forest Herbicides. *Wildlife Society Bulletin* 32:1042–1048.
- Ulev, E. 2008. *Crotalus horridus* in Fire Effects Information System. U.S. Department of Agriculture Forest Service Rocky Mountain Research Station Fire Sciences Laboratory. Online: <http://www.fs.fed.us/database/feis/>.
- United States Fish and Wildlife Service [USFWS]. 1989. Endangered and Threatened Wildlife and Plants: Threatened Status of *Hexatylis naniflora* (Dwarf-flowered Heartleaf). Federal Register 54:14964–14967.
- _____. 1991. Endangered and Threatened Wildlife and Plants: *Helianthus schweinitzil* (Schweinitz's Sunflower) .Determined to be Endangered. Federal Register 56:21087–21091.
- _____. 2005. Fish and Wildlife Service. Endangered and Threatened Wildlife and Plants. Federal Register 70:24870–24934.
- _____. 2008. Three Granite Outcrop Plants: Black-spored Quillwort (*Isoetes melanospora*), Mat-forming Quillwort (*Isoetes tegetiformans*), Little Amphianthus (*Amphianthus pusillus*)—5-year Review: Summary and Evaluation. USFWS, Southeast Region Georgia Ecological Field Services. Athens, GA.

- _____. 2014. Candidate Conservation Agreement for Georgia aster (*Symphyotrichum georgianum*). Asheville, NC.
- _____. 2015. Northern Long-Eared Bat (*Myotis septentrionalis*) Fact Sheet. Available online from <http://www.fws.gov/midwest/endangered/mammals/nleb/pdf/NLEBFactSheet01April2015.pdf>.
- _____. 2016. Key to the Northern Long-Eared Bat 4(d) Rule for Federal Actions that May Affect Northern Long-Eared Bats. Available online from https://www.fws.gov/midwest/endangered/mammals/nleb/pdf/KeyFinal4dNLEB_FedAgencies17Feb2016.pdf.
- Van Lear, D. H., and R. F. Harlow. 2000. Fire in the Eastern United States: Influence on Wildlife Habitat. The Role of Fire in Nongame Wildlife Management and Community Restoration: Traditional Uses and New Directions. Proceedings of a Special Workshop General Technical Report NE-288.
- Van Lear, D.H. and T.A. Waldrop. 1989. History, uses, and effects of fire in the Appalachians. General Technical Report SE-54. U.S. Department Agriculture, Forest Service, Southeastern Forest Experiment Station.
- Vincent, S.H. 2003. Kings Mountain National Military Park Cultural Landscape Report. Cultural Resource Division, Southeast Regional Office, National Park Service.
- Weakley, A. S. 2012. Flora of the Southern and Mid-Atlantic States, Working Draft of 30 November 2012. Accessed June 2015 from http://www.herbarium.unc.edu/FloraArchives/WeakleyFlora_2012-Nov.pdf.
- Weeks, D.P. 2002. Water Resources Scoping Report. Technical Report NPS/NRWRD/NRTR-2002/296. Kings Mountain National Military Park, South Carolina.
- White, R.D. Jr. and T. Govus. 2004. Vascular Plant Inventory and Plant Community Classification for Kings Mountain National Military Park. Durham, North Carolina: NatureServe.
- Zebehazy, L.A., J.D. Lanham, T.A. Waldrop, and K.F. Connor. 2004. Seasonal Avifauna Responses to Fuel Reduction Treatments in the Upper Piedmont of South Carolina: Results from Phase 1 of the National Fire and Fire Surrogate Study. General Technical Report SRS-71. USDA Forest Service Southern Research Station.

APPENDIX A—SCOPING BROCHURE

**Kings Mountain National Military Park
Kings Mountain State Park
Crowders Mountain State Park**



Public Scoping and NEPA Process for the Kings Mountain Parks Interagency Fire Management Plan

Project Scoping for Environmental Assessment

November 21, 2014

Kings Mountain National Military Park (KIMO) is joining with its neighbors, Kings Mountain State Park (KMSP) in South Carolina, and Crowders Mountain State Park (CRMO) in North Carolina, to develop a joint Fire Management Plan (FMP). Policy from federal and state agencies recommends developing FMP's on an interagency basis whenever possible. Before this interagency FMP is developed, the National Park Service (NPS), in cooperation with the state parks, is preparing an Environmental Assessment (EA). This EA is part of the process to address changes in fire management strategies, vegetation communities, and fuel loading that has occurred over the years since historic settlement of the area, and since the 3 parks were created. This EA process will be employed to gather public input and suggestions for the interagency EA and FMP. This newsletter launches the public scoping phase for the EA.

Background

The Kings Mountain area is a relatively small, but scenic ridge that rises above the surrounding countryside and exhibits abundant forest, vegetation and wildlife habitat. The area looks much different from pre-settlement conditions when lightning or Native American ignited fires were frequent. The frequency of these fires varied from 2–100 years, depending on wind patterns, sheltering, vegetation types, and other natural factors. Generally the fires were low intensity ground fires that reduced underbrush, small trees, and forest litter and debris. Trees were larger and more widely spaced; the ground was covered with grasses and forbs; cane breaks were more widespread in riparian areas; and "balds" or meadows with scattered clumps of trees predominated on higher ridge areas.

KIMO was created by congress to protect the site and scene of a pivotal battle in the Revolutionary War. After the war the area was altered by human activities such as logging, farming, and homesteading before the parks were established; regrowth of forests and fire suppression contributed to creating the thick successional forests now found in much of the area. These forests are more susceptible to non-characteristic stand replacing, or high severity wildfires. These types of fires may become larger, more frequent, and more difficult to control with climate change. They create risk to park facilities, the historic landscapes such as the Kings Mountain battlefield, private property structures adjacent to the parks, and natural plant and wildlife communities.

Kings Mountain natural and fire dependent communities have provided niches for wildlife and plant species for thousands of years and are at risk of being lost due to altered vegetation structure brought about by all these changes.

All 3 parks have initiated limited programs of prescribed burning and vegetation management, but are embarking on this planning process to provide future direction.

Until the interagency FMP is completed, the parks will continue to suppress wildfires and engage in limited vegetation management activities allowed in their guidance documents. A new FMP is vital to address the need to manage vegetation and fire on an interagency basis; the need to better protect facilities and neighboring private properties; the need to restore fire dependent communities and related species; and to incorporate updates in national fire policy and terminology. For the new FMP, the parks are considering pro-active strategies to more actively manage Kings Mountain vegetation and wildland fire.

Fire Management Goals

The parks plan to follow these broad goals as they develop the new FMP:

1. Firefighter and public safety is the top priority
2. Protect NPS, state and private infrastructure, facilities and property.
3. Manage and maintain historic, cultural, recreational, and aesthetic landscapes.
4. Restore and protect natural and ecological values.
5. Minimize high severity and human caused/unwanted wildfire.
6. Promote communication and cooperation on fire management activities between agencies and the public.

Each park may develop individualized objectives that relate to the above goals. For example, KIMO plans to emphasize efforts to restore and maintain the battlefield vegetation as to how it appeared during the 1780 battle. KMSP wants to stress defensible space protection of its living history farm area. CRMO's intent is to reduce understory leaf litter to reduce wildfire risk, and to promote the germination of fire dependent species, such as bear oak (*Quercus ilicifolia*), as well as native grasses and ferns.

Planning Process

Internal scoping by park specialists and staff started the EA process on September 16, 2014. This EA will be prepared in compliance with the National Environmental Policy Act (NEPA) to provide the decision-making framework that 1) explores management alternatives to meet park(s) objectives, 2) evaluates potential impacts to park resources and values, and 3) identifies mitigation measures to minimize the degree of these impacts.

The EA will at least evaluate a “No Action Alternative” and two “Proposed Action Alternatives”. Additional alternatives or changes to these alternatives could result from public comments. The draft alternatives are:

A) The “**No Action Alternative**” would continue what is now occurring in each park. KIMO would continue using the strategies in its current fire management plan. Fire suppression, prescribed burning, mowing of grass areas, and spot treatment of invasive vegetation by herbicide would continue. Handheld mechanical equipment such as chainsaws and leaf-blowers would be utilized in support of the above activities. Mechanical treatments such as mastication, and wildfire managed for resource objectives would not be allowed. There would be no interagency FMP; each park would follow its own management direction.

The attendant negative effects would include continued accumulations of hazardous fuels and the associated risk both to human structures and to natural and cultural resources; the individual park approach to fire and vegetation management might prevent the synergy that an interagency approach would provide in a joint FMP.

B) “**Proposed Action Alternative (#1)**” would allow the use of a full array of fire management tools/strategies including suppression, prescribed burning, mowing of grass areas, spot treatment of invasive vegetation by herbicide, mechanical treatments using wheeled or tracked equipment (mastication), and wildfire managed for resource objectives. Handheld mechanical equipment such as chainsaws and leaf-blowers would be utilized in support of the above activities. Under this alternative, there would be no aerial or

While “wildfire managed for resource objectives” could be utilized, use would be limited due to the relatively small size and shape of the park areas, and lack of natural ignitions (lightning). If utilized, it would be in limited circumstances where fire risk is not excessive, for short periods of time, where important values were not threatened, and the burning conditions are similar to prescribed fire prescriptions. Upon confirming a managed natural ignition, the fire management staff would immediately develop the future containment boundaries of the wildfire. Wildfires managed for resource objectives would not be allowed to cross a park boundary without the agreement of the adjacent park or agency. Wildfires managed for resource objectives would only be used if the ignition was in an area that had burned relatively recently, so that fire effects would be helpful for ecological restoration or fuel reduction.

vehicle spraying of herbicides by the NPS, and widespread thinning of larger trees (over 6-inch diameter) would not occur. The FMP would be interagency between all three parks, but could include differences based on different park objectives and state regulations.

C) “**Proposed Action Alternative (#2)**” would include the full array of fire management tools as discussed in the second alternative, but would exclude managing wildfires for resource objectives. The FMP would be interagency between all three parks, but could include differences based on different park objectives and state regulations.

Additional objectives and mitigation tactics would be developed as part of this EA process to minimize the impacts to park resources and manmade improvements. Examples of potential mitigation activities include defining when/where wildfire for resource objectives is appropriate; measures to protect wildlife, soils, and water resources during vegetation management activities; and local public notification procedures for prescribed burns. Prescribed burns would have formal objectives developed under a separate burn plan, and would only be implemented by qualified fire personnel.

Park managers would implement any changes at a reasoned pace to allow wildlife, vegetation, residents, and visitors time to adjust to the management changes regardless of which alternative is selected. All actions would be dependent on future funding. The parks believe that a well-managed and focused fire and vegetation management program is vital to the protection and restoration of these parks.

Steps in the Process

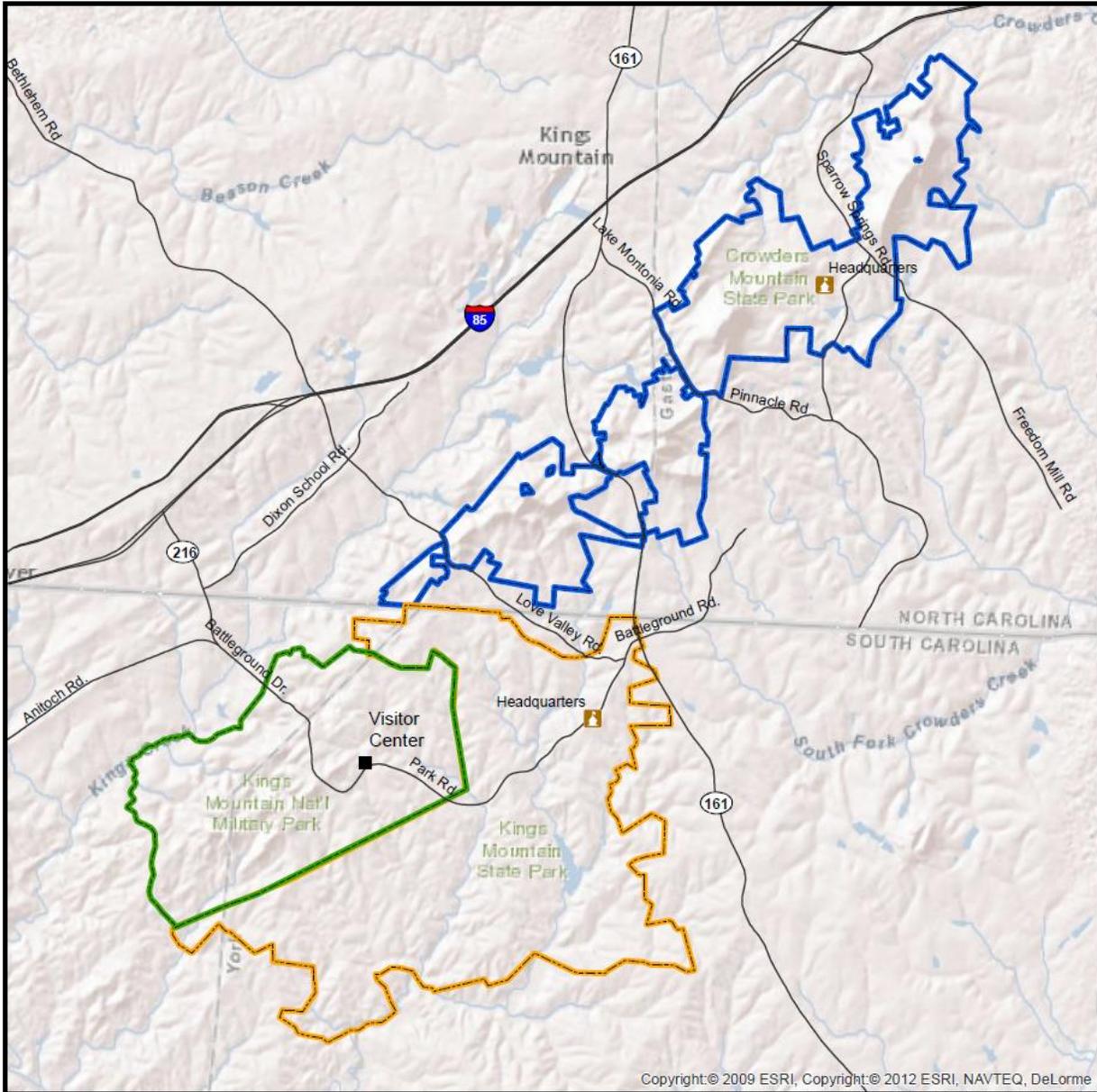
There are two formal opportunities for the public to comment: during this initial public scoping period, and again following the release of the EA document. You are invited to participate in this process by voicing your ideas, suggestions, comments, or concerns related to Kings Mountain parks area fire management activities. These comments will be considered during preparation of the EA and before managers make a final decision.

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

- **Public scoping/input period (November 21–December 21, 2014)***
- **Public scoping meeting, open house format, December 9, 2014 at 6:30 PM, Kings Mountain National Military Park visitor center***
- Preparation of the EA, (public release expected early summer 2015)
- **Public review of the EA***
- Analysis of public comments on the EA
- Preparation of decision document
- Announcement of decision
- Drafting and approval of the new FMP

* indicates formal opportunities for public comment

**Kings Mountain National Military Park
Kings Mountain State Park
Crowders Mountain State Park**



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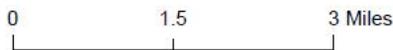
Boundaries

- Kings Mountain National Military Park (~3,900 acres)
- Kings Mountain State Park (~15,000 acres)
- Crowders Mountain State Park (~5,000 acres)



Datum: NAD 83 17N UTM
DSC/October 2014

1:87,000



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APPENDIX B—GLOSSARY

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

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

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

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

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

Categorical Exclusion (CE) Certain pre-defined exceptions to the National Environmental Policy Act (NEPA) that allow activities to occur without full, detailed environmental analysis, or where a general analysis for certain actions have been done in advance.

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

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

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

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

Escaped Prescribed Fire Prescribed fires are intentionally ignited fires by management that burn under specified conditions and a written plan. If the fire escapes the burn unit, the contingency component of the Prescribed Burn Plan is activated. If it is successful in bringing the fire back within the scope of the Prescribed Burn Plan, the project may continue. If prescribed fire objectives are exceeded or no longer met,

and the fire continues, it becomes a wildfire and appropriate management of the fire occurs, usually suppression.

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

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

Fire Management All activities related to the management of wildland fires, including preparation, prevention, cooperative activities, staff training and fire equipment work, fuels/vegetation management work, prescribed burning, and response to wildfires.

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

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

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

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

Foam Chemical or dispersant additive to water, usually detergent based, that allows the water-foam mix to be more effective when used on vegetation/fuels to hinder burning. The mix may smother or cool the fire, allows it to better penetrate fuels, and/or does direct extinguishment of flame. Usually applied by fire engines with automatic mixing equipment, helicopter bucket drops, or (rarely) ground pumps using fixed water sources. There are additional products now being used where some engines can apply "structural foam" directly to structures in advance of wildfire impact to prevent fire from igniting the structure. It is usually longer lasting, and is usually washed off the structure after the fire threat is over.

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

Hazard Fuels Excessive live and/or dead wildland vegetation accumulations (either natural or created) having the potential to cause high intensity wildland fire.

Hazard Fuel Reduction Hazard fuel reduction projects remove excessive live or dead fuel to protect life, property, cultural, and natural resource values. Those values can include structures, infrastructure, and private properties; natural resources including critical native plant communities and their processes including

threatened and endangered species; and important cultural, historic, and/or archaeological resources. Hazard fuel reduction treatments include a variety of fire and non-fire technique— prescribed fire, wildfire managed for multiple objectives including resource objectives, mechanical vegetation cutting and removal, targeted herbicide application, and manual methods of fuel removal. Clear cutting of all vegetation is not considered an appropriate fuel reduction technique in park areas.

Herbicide Use In this analysis targeted herbicide application is used as a follow-up treatment to fuel reduction created by mechanical or manual treatments, prescribed burning, and/or wildfires. This helps slow regrowth of brush and small trees in targeted areas to help with defensible space or habitat restoration activities, and/or preventing or controlling exotic non-native plant establishment.

Incident Objectives Wildfire incident specific written guidance and direction that directs the selection and implementation of strategies and tactics to guide firefighting and fire management resources. Incident objectives come from fire management plans, park unit plans, and direction of park managers.

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

Initial Attack First action(s) taken at the fire scene to suppress a wildfire, consistent with firefighter and public safety, and values to be protected. Describes the initial response and subsequent actions on most fires, where the intent is to suppress the fire as safely, quickly and cost effectively as possible. Term usually applies where the focus is on full perimeter control and extinguishment in the first burning period.

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

Manual Treatments Activities that occur through the use of non-motorized hand tools (ax, pulaski, cross-cut saw, pruners, shovel, etc.). It is a method of reducing hazardous accumulations of wildland fuels, and is used to create defensible space near structures or values.

Mechanical Treatments Vegetation management activities that include using wheeled or tracked equipment (mowers, masticators, choppers, skidders, fire plow, etc.) and/or handheld motorized equipment (weed eaters, chainsaws, hand-held brush cutters, leaf blowers, etc.). It is a method of reducing or altering accumulations of wildland vegetative fuels to prevent high intensity fire. Mechanical treatments are used for forest restoration in altering vegetative fuel arrangements, defensible space around structures or other values, and creating fuelbreaks.

Minimum Impact Suppression Techniques (MIST, also referred to as Minimum Impact Suppression Tactics or Minimum Impact Techniques) are guidelines that assist fire personnel in the choice of procedures, tools, and equipment used in fire suppression and post-fire rehabilitation. These techniques reduce soil disturbance, impacts to water quality, wildlife, vegetation, visual scene, noise, , cultural areas, intrusions in the wilderness, and other local values. MIST policy is the primary guidance in NPS units, but is also utilized in many other agency areas.

National Environmental Policy Act (NEPA) Process The objective analysis of a proposal to determine the degree of its environmental and interrelated social and economic impacts on the human environment,

alternatives and mitigation that reduce that impact, and the full and candid presentation of the analysis to, and involvement of, the interested and affected public.

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

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

Prescribed Fire Fires originating from a planned ignition to meet specific objectives identified in a written, approved, prescribed burn plan. NEPA requirements are met prior to ignition (see planned ignition). Any fire intentionally ignited by management under an approved plan to meet specific incident objectives.

Protection The actions taken to limit the adverse environmental, social, political, and economical effects of fire including management actions taken to protect human and physical values in the wildland environment.

Resource Advisor(READ) Assigned position on many longer and more complex wildfire incidents. Usually a trained resource specialist who assists the incident commander and fire organization by providing focus and specialized knowledge related to protecting and preventing damage to unit natural and cultural values and resources.

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

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

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

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

Unplanned Ignition The initiation/start of a wildfire by lightning, volcanoes, and unauthorized human-caused ignitions in wildland vegetation (see wildfire).

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

equipment available to use is usually set by policy and the Fire Management Plan. The specifics are usually laid out in the Fire Management Plan or other written site specific treatment plans or defensible space plans.

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

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

Wildfire Managed for Multiple Objectives Including Resource Objectives (also management of wildfires for multiple/resource objectives) A term used to describe a fire usually started by lightning (unplanned ignition) and allowed to burn under written, defined conditions for various objectives including resource management objectives. Examples of multiple objectives include safety, cost, and protecting values at risk. Resource objectives include returning fire to a fire adapted ecosystem, reduction of hazard fuels, opening up areas for fire adapted species, decreasing brush, renewing grassland habitat for herbivores, opening up the tree canopy for endangered bird species, reducing the chance of stand replacing fire in more extreme conditions, etc. Managing or partially managing a fire for resource objectives is only allowed where pre-planned in an approved FMP. Use may be limited by availability of firefighting resources, safety, weather, vegetation conditions, fire behavior, national and regional fire preparedness levels, values at risk (natural, cultural, and private property), and other factors. A fire may be managed for resource objectives in one area, while being suppressed in another area; also these objectives can change with time or as the fire travels across the landscape. Human caused wildfires that escape initial attack may be considered to be managed or partly managed for resource objectives by the NPS in certain circumstances.

Wildland Urban Interface (WUI) An area where structures and human developments meet and intermingle with vegetative fuels or undeveloped lands.