
Chapter 4

ENVIRONMENTAL CONSEQUENCES



Photograph Courtesy of: Harold Jarrell

Vista from the Pinnacle

Cumberland Gap National Historical Park
Draft General Management Plan/
Environmental Impact Statement

THIS PAGE INTENTIONALLY LEFT BLANK

CHAPTER 4 ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

The National Environmental Policy Act (42 U.S. Code 4321, et seq.) mandates that environmental impact statements disclose the environmental impacts of proposed federal actions. In addition the proposed federal action is also an undertaking under Section 106 of the National Historic Preservation Act (16 U.S. Code, 470f). In this case the proposed federal action is the implementation of the general management plan for Cumberland Gap National Historical Park. This chapter provides an analysis of the impacts that could result from implementing the management alternatives, as described in Chapter 2, on natural resources, cultural resources, the socioeconomic environment, and other impact topics. This general management plan establishes management objectives and implementation actions needed to manage Cumberland Gap National Historical Park for the next 20 years. Therefore, the analysis period of this environmental impact statement is 20 years.

The alternatives provide broad management direction for the park. Because of the general and conceptual nature of the alternatives, the potential consequences of implementing an alternative can only be analyzed in general terms. Thus, this general management plan/environmental impact statement should be considered a programmatic analysis. Prior to undertaking specific actions as a result of this general management plan, appropriate detailed environmental and cultural compliance documentation will be prepared in accordance with the National Environmental Policy Act, the National Historic Preservation Act and other legal and policy requirements. The public will have opportunity to review and comment during the implementation phase as well.

Specific designs, layouts, footprints, and other individual project features are addressed separately during future implementation. Management zones presented in this general management plan are established to provide a set of appropriate activities and facilities for decision-making purposes. The fact that a particular zone may allow for certain activities or types of facilities does not mean that those facilities would be developed in that zone, nor does it mean that such facilities would be allowed to cover that entire zone. For example, the Developed Zone indicates that visitor services are available in terms of information, comfort stations, access via roads and trails, contact stations, and other facilities. However, it does not imply that the entire zone would be developed, but rather that the general size of the Developed Zone varies across alternatives and, therefore, the potential for the types of facilities and activities and related impacts associated with that alternative vary as well.

Included in Chapter 4 is a summary of the laws and policies relevant to addressing environmental consequences, definitions of impact thresholds (for example, negligible, minor, moderate, and major), methods used to analyze impacts, and the analysis methods used for determining cumulative effects and impairment. Impact topics presented in this chapter and the organization of the topics correspond to the discussion contained in Chapter 3, "Affected Environment."

SUMMARY OF LAWS AND POLICIES

Four overarching environmental protection laws and policies guide the actions of the NPS in the management of the parks and their resources: the NPS Organic Act of 1916, the National Environmental Policy Act and its implementing regulations, the National Historic Preservation Act and its implementing regulations, and the Omnibus Management Act. For a complete discussion of these and other guiding regulations, refer to Chapter 1 as well as Appendix B. These guiding regulations are described in brief below.

The *Organic Act of 1916* (16 U.S. Code, §1) commits the NPS to making informed decisions that perpetuate the conservation and protection of park resources unimpaired for the benefit and enjoyment of future generations.

The *National Environmental Policy Act of 1969* is implemented through the Council on Environmental Quality regulations (40 Code of Federal Regulations 1500-1508). NPS procedures for compliance with these regulations are detailed in *Director's Order 12: Conservation Planning, Environmental Impact Analysis, and Decision-making handbook* (NPS 2001b).

The *1966 National Historic Preservation Act, Section 106*, is implemented through the Advisory Council on Historic Preservation's regulations (36 Code of Federal Regulations 800). These regulations require that, as a federal agency, the NPS must assume responsibility for cultural resources within the parks and must take into account the effects of NPS undertakings on these historic properties (e.g., cultural resources eligible for or listed on the National Register of Historic Places). NPS procedures for compliance with these regulations are outlined in *Director's Orders 28 and 28A, Cultural Resource Management and National Park Service Management Policies*.

The *Omnibus Management Act* (16 U.S. Code 5901, et seq.) underscores the National Environmental Policy Act in that both are fundamental to park management decisions. Both acts provide direction for connecting resource management decisions to the analysis of impacts and communicating the impacts of these decisions to the public, using appropriate technical and scientific information. Both acts also recognize that such data may not be readily available, and they provide options for resource impact analysis should this be the case. Section 4.5 of *Director's Order 12* adds to this guidance by stating, "When it is not possible to modify alternatives to eliminate an activity with unknown or uncertain potential impacts, and such information is essential to making a well-reasoned decision, NPS will follow the provisions of the Council on Environmental Quality regulation (40 Code of Federal Regulations 1502.22)." If the incomplete information relevant to reasonably foreseeable significant adverse impacts is essential to a reasoned choice among alternatives and the overall costs of obtaining it are not exorbitant, the agency is directed to include the information in the environmental impact statement. If the relevant information cannot be obtained because the overall costs of obtaining it are exorbitant or the means to obtain it are not known, the agency is directed to include the following within the environmental impact statement:

- A statement that such information is incomplete or unavailable;
- A statement of the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts on the human environment;
- A summary of existing credible scientific evidence relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment; and
- The agency's evaluation of such impacts based on theoretical approaches or research methods generally accepted in the scientific community.

The term "reasonably foreseeable" includes impacts that have catastrophic consequences, even if their probability of occurrence is low, provided that analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason. Collectively, these guiding regulations provide a framework and process for evaluating the impacts of the alternatives proposed in the general management plan / environmental impact statement.

IMPACT ASSESSMENT METHODS

The NPS based the impact analysis and the conclusions largely on the review of existing scientific literature and studies; information provided by experts in the NPS, other agencies, universities, and the public; and professional judgment. This method of analyzing impacts is further explained below. It

is important to remember that impacts have been assessed assuming mitigating measures have been implemented to minimize or avoid impacts. However, any reduction in intensity of impact from mitigation is an estimate of the effectiveness of mitigation *only* under the National Environmental Policy Act. The level of effect as defined by Section 106 is *not* similarly reduced, because cultural resources are nonrenewable and adverse effects that consume, diminish, or destroy the original historic materials or form, will result in a loss in the integrity of the resource that can never be recovered. Therefore, even if actions determined to have an adverse effect under Section 106 may be mitigated, the effect remains adverse.

A brief description of relevant components of existing conditions is presented for each impact topic in Chapter 3. This information is the basis for determining the effects of implementing each alternative. The impact analyses involved the following steps:

- Defining the issues of concern, based on scoping;
- Identifying the geographic area that could be affected;
- Defining the resources within the area that could be affected;
- Identifying the effects caused by the management alternative, comparing these to Alternative A, No Action, and determining the relative change in resource conditions;
- Director's Order 12, Conservation Planning, Environmental Impact Analysis, and Decision Making, presents an approach to identifying the duration (short- or long-term), type (adverse or beneficial), and intensity or magnitude (e.g., negligible, minor, moderate, or major) of the impact(s), and that approach has been used in this document;
- Defining whether the effect would be beneficial or adverse;
- Defining the level of intensity of the effect as negligible, minor, moderate, or major. Impact topic-specific thresholds for each of these intensities are provided in each impact topic method section. Threshold values were developed based on federal and state standards and consultation with NPS and other agency resource experts. Because definitions of intensity vary by impact topic, intensity definitions are provided separately for each impact topic analyzed in this document;
- Defining the duration of the effect as either short-term or long-term. This is defined in the method for each impact topic. Where duration is not noted in the impact analysis, it is considered long-term;
- Defining the area affected by the alternative, such as the entire park (park-wide), or specific habitats within the park. Certain types of effects, such as socioeconomic, can occur outside the park. The area of effect is defined by impact topic;
- Determining the cumulative effects by evaluating the effect in conjunction with the past, present, or reasonably foreseeable future actions for Cumberland Gap National Historical Park and the region. Additional detail regarding the method for determining cumulative effects is provided in sections that follow;
- Determining whether impairment would occur to resources and values considered necessary and appropriate to fulfill the purposes of Cumberland Gap National Historical Park. Additional detail regarding the method for analyzing impairment is provided in the sections that follow.
- Estimates of impact or effect on a historic property listed on or eligible to be listed on the National Register was conducted in accordance with 36 Code of Federal Regulations 800. Effects on archeological resources, ethnographic resources, historic buildings and structures, and cultural landscapes were identified and evaluated by:
- Determining the area of potential effects;

- Identifying historic property/ies present in the area of potential effects that are either listed in or are potentially eligible to be listed in the National Register;
- Applying the criteria of adverse effect to all the listed or potentially eligible cultural resources that could be affected; and
- Considering ways to avoid, minimize, or mitigate adverse effects.
- Additional details regarding the specific method used to assess these types of impacts and effects are provided in the section entitled “cultural resources.”

CUMULATIVE IMPACT ANALYSIS

The Council on Environmental Quality (1978) regulations for implementing the National Environmental Policy Act require assessment of cumulative impacts in the decision-making process for federal actions (40 Code of Federal Regulations 1508.7 and 36 Code of Federal Regulations 800). Cumulative impacts are defined as “incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or nonfederal) or person undertakes such other action.” Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time.

Cumulative impacts were determined by combining the impacts of each management alternative with known past, present, and reasonably foreseeable future actions. Other actions that have the potential to have a cumulative effect in conjunction with measures that would be implemented in this general management plan were identified in Chapter 1 under the “Relationship of Other Planning Efforts to This General Management Plan” section. Cumulative impacts are considered for all management alternatives, including the no action alternative.

In addition to specific agency actions and programs, other activities would continue within the park or in the region that would cumulatively impact resources. These would include impacts related to land development activities in the tri-state area and increases in visitation, population, and employment. Projects and actions that could potentially affect resources at the park are listed below. Appendix I provides more detailed summaries of each of these actions.

Past Actions

The time period included in the cumulative effects analysis stretches from the 1880s until early 2007. For cultural resource impact topics, the time period for this analysis is from the 1700s to the present and is described separately in that section. The following is a list of past actions:

- Little Yellow Creek dammed in the 1880s to become Fern Lake
- Fern Lake Watershed Declared Unsuitable for Coal Mining (Federal Register: September 23, 1996)
- Fern Lake Watershed Acquisition
- Recommended Wilderness (Potential and Recommended) is designated (1978 Cumberland Gap National Historical Park Master Plan)
- Tunnel to improve highway safety and to allow completion of the Wilderness Road Restoration Project
- Construction of Daniel Boone Visitor Information Center in 2004
- Hensley Settlement Restoration
- Leasing of Civic Park and Renovation

- Rehabilitation of Main Visitor Center
- Wilderness Road Campground Improvements
- Bearproof Facilities for Backcountry Campsites
- Restoration of Gap Cave
- Establishment of Nearby State Parks
- Multi-laning of U.S. 25E Between I-81 and I-75 (including safety improvements)
- Bartlett Park Improvements
- Middlesboro Bell County Airport

Present and Future Actions

- Continued management of Recommended Wilderness in accordance with Wilderness Act and NPS policies.
- Continued Park Maintenance
- Acquisition of Fern Lake and surrounding area
- Winchester to Cumberland Gap Trail, following the Great Wagon Road/Wilderness Trail
- T.J. Asher Industrial Park and Airport
- Pine Mountain Historical Trail
- Construction of a composting toilet at Fern Lake
- Park resource inventories, guides, assessments and reports (including archeological, landscape, baseline, and resource stewardship strategy)

The cumulative effects of these actions are defined according to their relationship to each impact topic. To avoid repetition of this list in the cumulative impacts sections of the general management plan, general discussions of the cumulative effects for each impact topic are provided.

IMPAIRMENT ANALYSIS

In addition to determining the environmental consequences of implementing the preferred alternative and the other alternatives, NPS *Management Policies 2006* (section 1.4) requires analysis of potential effects to determine whether or not proposed actions would impair Cumberland Gap National Historical Park's resources and values.

The fundamental purpose of the National Park System—established by the Organic Act and reaffirmed by the General Authorities Act, as amended — begins with a mandate to conserve park resources and values. NPS managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adverse impacts to park resources and values. However, the laws do give the NPS management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of the park, so long as the impact does not constitute impairment of the affected resources and values.

The fundamental purpose of all parks also includes providing for the enjoyment of park resources and values by the people of the United States. The enjoyment contemplated by the statute is broad; it is the enjoyment of all the people of the United States and includes enjoyment both by people who visit parks and by those who appreciate them from afar. It also includes deriving benefit (including scientific knowledge) and inspiration from parks, as well as other forms of enjoyment and inspiration.

Congress, recognizing that the enjoyment by future generations of the national parks can be ensured only if the superb quality of park resources and values is left unimpaired, has provided that when there is a conflict between conserving resources and values and providing for enjoyment of them, conservation is to be predominant. This is how courts have consistently interpreted the Organic Act (NPS 2006a).

The impairment, prohibited by the Organic Act and the General Authorities Act, is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of Cumberland Gap National Historical Park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values (NPS *Management Policies* 2006, section 1.4.5). An impact on any park resource or value may constitute impairment. “An impact would be more likely to constitute impairment to the extent that it affects a resource or value whose conservation is:

- Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Cumberland Gap National Historical Park; or
- Key to the natural or cultural integrity of Cumberland Gap National Historical Park or to opportunities for enjoyment of the park; or
- Identified in Cumberland Gap National Historical Park’s general management plan or other relevant NPS planning documents as being of significance.”

Impairment may result from NPS administrative activities in managing the park, visitor activities, or activities undertaken by concessioners, contractors, and others operating in the Cumberland Gap National Historical Park. Impairment may also result from sources for activities outside the park (NPS 2006f).

A determination on impairment is made in the conclusion section for each impact topic related to Cumberland Gap National Historical Park’s resources and values. An evaluation of impairment is not required for topics related to the socioeconomic environment, visitor use and experience (unless the impact is resource based), transportation, NPS operations, concession operations and commercial services, or public health and safety since these topics are not considered park resources.

NATURAL RESOURCES

This section provides a summary of major characteristics of the natural resources in the park. This includes geological resources (cliffs, caves, and karst), soils, water quality, fisheries / aquatic resources, wetlands, vegetation—native plant communities, and species of special concern.

GEOLOGICAL – CLIFFS, CAVES, AND KARST

Regulations and Policies

Regulations and policies that guide NPS actions with respect to cliffs, caves, and karst are summarized in the “Servicewide Mandates and Policies” section of Chapter 1 and in Appendix B.

Method

This impact topic is included to address planning team concerns regarding possible effects of the increased access on cliff, cave, and karst resources and also to address the effects of increased levels of education, outreach and partnering with caving groups. Effects on cliff, cave, and karst resources were addressed by identifying the specific types of activities proposed under each alternative and by making a qualitative estimate of the potential effects resulting from physical disturbance of the cliff, caves, and karst resources resulting from visitor use.

The NPS would prepare site-specific environmental assessments for new construction projects in the park, where impacts were anticipated. The environmental assessment would address the potential effects of a proposed action on cliff, cave, and karst resources, as appropriate. Best management practices would be employed to minimize potentially adverse effects on these resources.

Impact thresholds were used to estimate the intensity of each estimated effect on cliff, cave, and karst resources. Thresholds for this impact topic are presented in Table 17.

Table 17. Impact Thresholds for Geological – Cliff, Cave, and Karst Resources

Negligible: No changes would occur, or else changes in cave formations, cliffs, or karst features would be below or at the level of detection.
Minor: Changes in cave formations, cliffs, or karst features may be measurable. No resource protection measures would be necessary.
Moderate: Changes in cave formations, cliffs, or karst features would be visible and measurable. Cliffs would be physically and visibly altered. Karst features would be physically altered. Cave formations would be affected by deterioration or changed depositional patterns. Resource protection measures for these effects would be necessary, and the measures would likely be successful.
Major: Changes in cave formations, cliffs, or karst features would be visible and measurable. Cliffs would be physically and visibly altered. Karst features would be physically altered. Cave formations would be affected by deterioration or changed depositional patterns. Resource protection measures for these effects would be necessary and the measures could not be guaranteed.
Duration: Long-term: Effects last more than 1 year. Short-term: Effects last less than 1 year.

Impacts of Alternative A

Under Alternative A, cliff, cave, and karst resources would continue to be managed as they are at the present time. Under Alternative A, the 24 cave features in the park would continue to be closely managed. Gap Cave would be managed under the Cave Management Plan. Informal partnering with regional caving groups and surveys of Gap Cave for endangered species by the U.S. Fish and Wildlife Service and authorized investigators from colleges and universities in the region, would continue to be conducted. Results of these surveys and studies would benefit management by providing additional information on cave resources. Guided tours of Gap Cave would also continue to be provided and closely managed under Alternative A, and there would not be an increase in the number of tours given by the park. Effects of touching and lint from clothing on cave formations and effects of artificial lights (flashlights) would continue to occur, and would be minimized by limiting the number of tours given each year and by use of flashlights only in the cave, as specified by guidance provided in the Cave Management Plan. Projected increases in visitation under Alternative A would, therefore, not have associated adverse effects on cave resources.

Under Alternative A, rock climbing would continue to be prohibited in the park unless authorized under a Special Use Permit such as for endangered species research by qualified investigators. This type of research is conducted relatively infrequently and according to high standards for resource protection. These surveys would continue to improve the knowledge base needed for protection and management of protected plants. The research program would have beneficial effects on cliff resources.

With the exception of several sinkholes, karst areas in the park are primarily underground and would not be affected by increased levels of visitation projected to occur under Alternative A. Above-ground sinkholes occur in the park, but these are located in remote areas and are not likely to be affected by

increased visitation under Alternative A. Overall, the impacts of management actions taken under Alternative A would be **short- and long-term, negligible adverse effects** on cliff, cave, and karst resources.

Cumulative Impacts

Past actions affecting cave resources have included the restoration of Gap Cave and management of the cave under the Gap Cave Management Plan. This has benefited cave resources by restoring previously degraded habitat, and by preservation, protection of cave formations and cave life, and proper management of visitor use. Protection measures have been implemented for the federally listed Indiana bat and potentially, the gray bat and other sensitive species. Informal partnerships with caving organizations have also resulted in expansion of scientific knowledge regarding cave life, and have resulted in beneficial effects on these resources and an improved ability to manage cave resources. Guided tours would continue to be given in Gap Cave, with a potential for cumulative effects over time related to lint build up, use of lights, and disturbance of cave life. However, these tours would be carefully managed under the Gap Cave Management Plan, which would minimize potentially adverse cumulative effects.

None of the future construction projects proposed for areas inside or outside the park would affect cliff, cave, and karst since they would not be constructed in the vicinity of park resources.

Surveys of the protected plants that live on the cliff systems in the park have been completed and management efforts to protect sensitive cliff species will continue into the future, providing long-term, beneficial effects.

When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting cliffs, caves, and karst resources are combined with actions under Alternative A, the resulting overall cumulative effects on cliff, cave, and karst resources are estimated to be **long- and short-term, negligible and adverse**.

Conclusions

The overall effect of management actions taken under Alternative A on cliffs, caves, and karst resources would be **long- and short-term, negligible and adverse**. No new construction activities or projects would occur in the park or in the surrounding area that would adversely affect these resources. No change in the present conservative and highly protective management of these resources would occur. Research programs on cliff, cave, and karst resources would continue to occur, providing additional information needed for successful resource management. These management actions would have long-term, major, beneficial effects on cliff, cave, and karst resources.

Past actions associated with caves, cliffs, and karst resources have focused on cave restoration, guided cave tours, and scientific research on cliff faces for protected species; these have resulted in beneficial effects. Under Alternative A, these activities would continue in the future. When the adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting cliff, cave, and karst resources are combined with actions under Alternative A, the resulting overall cumulative effects are estimated to be **long- and short-term, negligible, and adverse**.

There would be no impairment of cliffs, caves, and karst resources or values as a result of park actions taken under Alternative A.

Impacts of Alternative B

Under Alternative B, guided tours of Gap Cave and scientific research on cliffs and caves would continue to be sponsored and managed by the park at levels similar to Alternative A. Under

Alternative B, however, recreational rock climbing and rappelling would be defined as an appropriate activity, pending further study and consultation with regard to public health and safety, threatened and endangered species, resource sensitivity, or visitor experience. Rock climbing has the potential to cause physical damage to cliffs as a result of the use of climbing equipment and increased use of trails in the vicinities of cliffs. Environmental Assessments would also be required to determine suitable alternatives for these activities and the potential for adverse effects on cliff, cave, and karst resources. Measures to avoid, minimize or reduce potentially adverse effects on these resources would be taken during the assessment phases of the proposed activity. Overall, Alternative B is estimated to have **short- and long-term, negligible to minor and adverse effects** on cliff, cave, and karst resources in the park.

Cumulative Impacts

Cumulative effects of Alternative B on caves would be similar to Alternative A, since there would be no increase in caving activities, partnering programs, or activities affecting cliffs or karst areas. Rock climbing and rappelling activity in the Natural Zone would be possible pending results of further study. Other resource inventories and studies would occur over the long-term. Results of other studies would provide additional information to aid in the protection of resources as well as provide for rewarding visitor experiences.

When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting cliff, cave, and karst resources are combined with actions under Alternative B, the resulting overall cumulative effects are estimated to be **long- and short-term, negligible to minor, and adverse**.

Conclusions

Management actions proposed under Alternative B would not result in increased levels of visitor activities in Gap Cave or other cave features, cliffs, or karst areas in the park as compared with Alternative A. Alternative B could, however, result in increased use of cliffs for rock climbing under carefully managed Special Use Permits. Increased use of these areas could result in the disturbance of soil and vegetation along access trails and cliff areas. Environmental Assessments would be conducted to assess alternatives and assure avoidance and minimization of potentially adverse effects. Alternative B is estimated to have an overall **long-term, negligible to minor adverse effect** on cliff, cave, and karst resources in the park.

When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting cliff, cave, and karst resources are combined with actions under Alternative B, the resulting overall cumulative effects are estimated to be **long- and short-term, negligible to minor, and adverse**.

There would be no impairment of cliffs, caves and karst resources or values as a result of park actions taken under Alternative B.

Impacts of Alternative C

The effects of management actions proposed under Alternative C on cliff, cave, and karst resources would be similar to Alternative B, except that Alternative C would feature a formalized caving partnering program, to include creation of a wild caving program. The appropriate compliance would be completed before expansion of Gap Cave tours. This would result in an increased amount of research on caves and an associated improved ability to manage caves, but would also result in potential increased levels of visitor use and potential effects on cave resources. The park would continue to carefully manage these types of activities under the Cave Management Plan to minimize

the potential for these effects to occur. The formalized caving program would also include increased levels of research in park caves. This would lead to improved information needed to properly manage caves, and would help minimize the potentially adverse effects of increased visitor use over time.

Rock climbing and rappelling may be appropriate pending further study. Effects of this activity would be similar to those resulting from implementation of Alternative B. Activities associated with cliff and karst areas would be similar to Alternative B. Effects of Alternative C on cliff and karst resources would, therefore, be similar to Alternative B. Overall, Alternative C would have **long- and short-term, negligible to minor and adverse** effects on cliff, cave, and karst resources in the park.

Cumulative Impacts

Cumulative effects of Alternative C on caves would be similar to Alternative B.

When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting cliff, cave, and karst resources are combined with actions under Alternative C, the resulting overall cumulative effects are estimated to be **long- and short-term, negligible to minor and adverse**.

Conclusions

Alternative C would feature a formalized partnering program with caving groups and increased levels of research on cave resources. Alternative C would also feature creation of a wild caving program for Gap Cave and potentially rock climbing and rappelling pending further study. Alternative C is estimated to have **long-term, negligible to minor and adverse** effects on cliff, cave, and karst resources in the park.

Cumulative effects of Alternative C on caves would be similar to Alternative B. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting cliff, cave, and karst resources are combined with actions under Alternative C, the resulting overall cumulative effects are estimated to be **long- and short-term, negligible to minor and adverse**.

There would be no impairment of cliff, cave, and karst resources or values as a result of park actions taken under Alternative C.

SOILS

Regulations and Policies

Regulations and policies that guide NPS actions with respect to soils are summarized in the “Servicewide Mandates and Policies” section of Chapter 1 and in Appendix B.

Method

This impact topic is included to address planning team concerns regarding possible effects of increased access on soils in areas where new construction activity would occur (the majority of new construction would occur in the Developed Zone). Effects on soils were addressed by identifying the types of construction projects and actions proposed under each alternative and making a qualitative estimate of the potential effects on soils resulting from construction (excavation, clearing) and operation (soil erosion caused by runoff from pervious and impervious surfaces). The alternatives call for seven new minor facilities under Alternative B and 11 new minor facilities under Alternative C. In addition to this specific type of assessment, a generalized estimate of effects on soils was also made based on the types of facilities and visitor use in zones. The more generalized type of analysis is based

on a qualitative comparison of the relative amount of area that could be disturbed by construction and operation of new facilities in each zone. Depending on the zone, new facilities could include, for example, roads, trails, parking lots, utilities, buildings, and smaller facilities such as kiosks, shelters and signs. The types of facilities appropriate for each zone are identified in Table 6 of Chapter 2, “Alternatives.” It is assumed that a greater variety and number of facilities would be constructed and operated in the Developed Zone, as compared to the other zones, and that effects on soils are proportional to the amount of physical disturbance and runoff during storm events. It is also assumed that during operation, effects on soils would be related to runoff from paved areas during storm events or from increase trail use by visitors (horse, hiker).

The NPS would prepare a site-specific environmental assessment for park actions, including new construction projects. The environmental assessment will address the potential effects of a proposed project on soils. Best management practices would be employed to minimize potentially adverse effects on soils.

Impact thresholds were used to estimate the intensity of the estimated effects on soils. Thresholds for this impact topic are presented in Table 18.

Table 18. Impact Thresholds for Soils

Negligible: Soils would not be affected, or the effects on soils would be below or at levels of detection. There would be no discernable effect on the rate of soil erosion and/or the ability of the soil to support native vegetation.
Minor: The effects on soils would be detectable, but effects on soil productivity would be minimal. There would be detectable effects on the rate of soil erosion and/or the ability of the soil to support native vegetation. Mitigation may be needed to offset adverse effects and would be relatively simple to implement and would likely be successful.
Moderate: The effect on soil productivity would be readily apparent and would result in a change to the soil character. The rate of soil erosion and/or the ability of the soil to support native vegetation would be appreciably changed. Mitigation measures would be necessary to offset adverse effects and would likely be successful.
Major: The effect on soil productivity would be readily apparent and would substantially change the character of the soils. The actions would have a substantial, highly noticeable influence on the rate of soil erosion and/or the ability of the soil to support native vegetation. Mitigation measures to offset adverse effects would be extensively needed, and their success could not be guaranteed.
Duration: Long-term: Recovery of soils would take more than one year. Short-term: Recovery of soils would take less than one year.

Impairment of soils would occur if there were significant adverse effects on these resources or soils’ value where conservation was (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park, (2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park, or (3) identified as a goal in this general management plan or other NPS planning documents as being of significance.

Impacts of Alternative A

Under Alternative A, the only new proposed constructed would be a composting comfort station at Fern Lake. This project is limited in extent and would be expected to have negligible effects on soils near Fern Lake. Best management practices would be implemented during construction to minimize soil erosion. Roads, trails, a small building, and facilities currently present in the area surrounding the lake, would be left in place. Some sediment in storm water runoff from these previously disturbed or

developed areas would continue to erode and reach the lake during rainfall events, but the majority of the watershed would be left intact. Water quality would resemble current conditions in the near future.

During operation of the park under Alternative A, the existing management policies and programs would be continued. These policies and programs require maintenance of soils in the park along hiking trails, the visitor center, and all other park facilities. Existing authorized trails would continue to be maintained and unauthorized trails impacts would be mitigated and managed in a manner that avoids erosion. The overall effect of Alternative A on soils is estimated to be **long- and short-term, negligible and adverse**.

Cumulative Impacts

Past actions that have affected soils in the park include the damming of Little Yellow Creek in the 1880s to become Fern Lake, declaration of the Fern Lake watershed as being unsuitable for coal mining (Federal Register: September 23, 1996), the Wilderness Road preservation project, construction of the Daniel Boone Visitor Information Center in 2004, restoration of the Hensley Settlement, renovation of the Civic Park, rehabilitation of the main visitor center, Bartlett Park improvements, Wilderness Road Campground improvements, and construction at nearby state parks (Wilderness Road State Park, Pine Mountain State Park). During construction of facilities in these areas, soils were disturbed by clearing, excavation, and site preparation activities. Best management practices were employed to minimize soil erosion during construction.

Acquisition of the Fern Lake watershed resulted in continued preservation of the watershed and prevented development or other potential soil/land disturbing activities.

Present actions in the park or surrounding area that could affect soils include the multi-laning of U.S. 25E between I-81 and I-75. Multi-laning of U.S. 25E would result in soil erosion during construction. These effects would be minimized by implementation of best management practices. The multi-laning project would also result in increased storm water runoff to creeks in the vicinity, with an increase in the potential for soil erosion. Proper highway storm water management design would help minimize these effects.

Reasonably foreseeable future construction activities that could affect soils in the park or surrounding area would include future potential construction activities at the T.J. Asher Industrial Park and Airport, Bell County Technology and Training Park and Lee County Industrial Park, and construction of the Pine Mountain Historical Trail. During construction of facilities in these areas, soils would be disturbed by clearing, excavation, and site preparation activities. In addition, soils would be disturbed, paved, or covered, creating impervious surface conditions that could cause more storm water runoff in the future and if not properly managed, could cause soil erosion.

Acquisition of the remaining portion of the Fern Lake watershed will result in permanent preservation of the watershed.

When the adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting soils are combined with actions under Alternative A, the resulting overall cumulative effect would be **long- and short-term, minor and adverse**.

Conclusions

The only construction proposed under Alternative A would be the composting comfort station at Fern Lake, a minor construction project. This would have **short-term, negligible, adverse effects** on soils near Fern Lake. The acquisition of Fern Lake would preserve the majority of the Fern Lake watershed,

providing continued **long-term, moderate beneficial effects** on soils in the Fern Lake Watershed. Some soil erosion would continue to occur in the park as a result of use of trails and runoff from impervious surfaces. The overall effect of Alternative A on soils would be **long- and short-term, negligible and adverse**. When the adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting soils are combined with actions under Alternative A, the resulting cumulative effects would be **long- and short-term, minor and adverse**.

There would be no impairment of soil resources or values as a result of park actions proposed under Alternative A.

Impacts of Alternative B

As compared to Alternative A, Alternative B would provide for larger and more numerous Developed Zones, a greater potential for new facilities, and increased visitor access. In addition, construction of seven new minor facilities in Developed Zones at the Hensley Settlement, Fern Lake, and the Wilderness Road Campground would be constructed and would potentially affect soils (see Chapter 2 for detailed information on these projects).

Potential effects on soils during construction of new park facilities are related primarily to soil erosion that could result from storm water runoff from newly cleared areas. Construction effects would be minimized by implementation of best management practices. During operation, erosion could be caused by increased runoff from unpaved trails or from paved roads, parking lots, or roofs. Erosion could also be caused by increased visitor use of trails or other unpaved areas. For example, increased use of trails could result in inadvertent damage or adverse effects associated with soil compaction, runoff, sedimentation, and vegetation trampling or removal. Implementation of proper siting, design techniques and best management practices would minimize potentially adverse effects on soils.

The overall effect of Alternative B on soils would be **long- and short-term, minor and adverse**.

Cumulative Impacts

Cumulative effects of past, present, and reasonably foreseeable actions of Alternative B on soils would be similar to Alternative A. Seven minor facilities would be proposed for construction under Alternative B, and these would have negligible effects on soils. It is also anticipated that there would be relatively few future facilities in other parts of the park. When the adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting soils are combined with actions under Alternative B, the resulting overall cumulative effect would be **long- and short-term, minor and adverse**.

Conclusions

Construction and operation of the seven new proposed facilities, and construction of other potential new facilities in other areas of the park under Alternative B, would have **long- and short-term, minor and adverse effects** on soils. Potentially adverse effects on soils would be minimized by implementation of best management practices.

When the adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting soils are combined with actions under Alternative B, the resulting overall cumulative effect would be **long- and short-term, minor and adverse**.

There would be no impairment of soil resources or values as a result of park actions under Alternative B.

Impacts of Alternative C

Compared to Alternative A, Alternative C would provide for larger and more numerous Developed Zones, greater potential for new facilities, and increased visitor access. This would increase the potential for adversely affecting soils during construction and operation of any new facilities. In addition, 11 new minor facilities in Developed Zones at the Hensley Settlement, the base of Brush Mountain, Fern Lake, and the Wilderness Road Campground would be proposed for construction. These would have a potential to affect soils in these areas (see Chapter 2 for detailed information on these projects).

Unlike any other alternative, Alternative C features increased education and outreach programs that would help educate the public on issues related to soil erosion in the park. This could also lead to increased participation in trail maintenance programs by the public or other awareness programs relating to soil conservation. This would have a beneficial effect on soils in the park.

As compared to Alternative A, Alternative C has a potential to increase soil erosion in additional areas of the park as a result of construction and operation of limited new facilities. Prior to construction of new park facilities, site-specific environmental assessments would be prepared that would assess the potential effects of alternative sites and designs on natural and cultural resources. The soil tables (Appendix C) can be used to define the effects of a given project within the Fern Lake Watershed. Implementation of proper siting, design techniques, and best management practices would minimize potentially adverse effects on soils. The overall effect of Alternative C on soils is, therefore, estimated to be **long- and short-term, minor and adverse**.

Cumulative Impacts

Past, present, and reasonably foreseeable actions of Alternative C would be similar to Alternative B, except that Alternative C would also feature a total of 11 minor construction projects. These actions would potentially cause additional adverse effects on soils. Implementation of proper siting, design techniques, and best management practices would minimize potentially adverse effects on soils. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting soils, are combined with actions in Alternative C, the resulting cumulative effects of Alternative C are estimated to be **long- and short-term, minor and adverse**.

Conclusions

The overall effect of Alternative C on soils would be **long- term, minor and adverse**. Best management practices would be employed in the design and operation of any new facilities. Increased levels of education and outreach would have **long-term, beneficial effects** on soils by informing the public about soils erosion issues and by potentially increasing public participation in trail maintenance programs and increasing awareness.

When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting soils are combined with actions in Alternative C, the resulting cumulative effects of Alternative C would be **long- and short-term, minor and adverse**.

There would be no impairment of soil resources or values as a result of park actions under Alternative C.

WATER QUALITY

Regulations and Policies

Regulations and policies that guide NPS actions with respect to water quality are summarized in the “Servicewide Mandates and Policies” section of Chapter 1 and in Appendix B.

Method

This impact topic was identified as an issue of concern during the public scoping process. Issues identified included concerns about potential effects of construction of new park facilities on water quality and use of motorized vessels and how they might affect the drinking water supply of Fern Lake. Preservation of water quality in Fern Lake and elsewhere in the park was identified as an issue.

In this section, effects on water quality were addressed by identifying the specific construction projects proposed under each alternative and by making a qualitative estimate of the potential effects on water quality resulting from soil erosion during construction (excavation, clearing) and operation of new facilities (soil erosion caused by runoff from pervious and impervious surfaces). A generalized estimate of the effects on water quality was also made based on the types of facilities and visitor use appropriate for each zone. The majority of these effects would occur in Developed Zones.

This analysis assumes that effects on water quality resulting from implementation of an alternative would be a direct result of construction and operation of park facilities. These effects would parallel the effects on soils described in the previous section. All effects on water quality are also assumed to be local in extent. It is also assumed that gasoline powered vessels would not be allowed to be used in Fern Lake.

The NPS would prepare site-specific environmental assessments for proposed new construction projects in the park. Each environmental assessment would address the potential effects of a proposed project on water quality. Best management practices would be used to minimize potentially adverse effects on water quality.

Impact thresholds were employed to estimate the intensity of each estimated effect on water quality. Thresholds for this impact topic are presented in Table 19.

Table 19. Impact Thresholds for Water Quality

Negligible: Chemical, physical, or biological changes to water quality would not be detectable and would be below or within historical or desired water quality conditions.
Minor: Chemical, physical, or biological changes would be measurable but would be below water quality standards and would be within historical or desired water quality conditions.
Moderate: Chemical, physical, or biological changes to water quality would be measurable and readily apparent, but within all water quality standards. Water quality would be altered compared to historical baseline or desired water quality conditions. Mitigation would be necessary to offset adverse effects, and would most likely be successful.
Major: Chemical, physical, or biological changes to water quality would be readily measurable, and some water quality standards would be periodically approached, equaled, or exceeded. Water quality would be frequently altered from the historical baseline or desired water quality conditions. Extensive mitigation measures would be necessary and their success would not be assured.
Duration: Long-term: Effects last more than 1 year. Short-term: Effects last less than 1 year.

Impacts of Alternative A

Under Alternative A, water quality in Fern Lake would continue to be protected by the heavily forested, protected watershed. Roads, trails, a small building, and facilities currently present in the area surrounding the lake would be left in place. Some sediment in storm water runoff from these previously disturbed or developed areas would continue to erode and reach the lake during rainfall events, but the majority of the watershed would be left intact. Water quality would resemble current conditions in the near future.

The only construction proposed under Alternative A is the composting comfort station at Fern Lake, a minor construction project. This would have **short-term, negligible, adverse effects** on water quality associated with soil erosion near Fern Lake. Availability of comfort station facilities at Fern Lake would have a **long-term, minor, beneficial effect** on water quality of Fern Lake by controlling and treating wastewater. Continued protection of the Fern Lake watershed would provide long term, moderate beneficial effects to water quality.

Water quality in the park would continue to be impacted by non-point runoff from some existing unpaved trails, other unpaved surfaces, and runoff from paved, impervious surfaces in the park such as trails, roads, parking lots, and roof tops. Increased use of existing trails could result in inadvertent damage or adverse effects on water quality associated with soil compaction, runoff, sedimentation, and vegetation trampling or removal. Continuation of current management practices and use of best management practices would continue to control runoff from these sources.

Overall, Alternative A is estimated to have **short-term, negligible and adverse effects** on water quality.

Cumulative Impacts

Other than the new composting comfort station at Fern Lake, no other new facilities would be constructed in the park under Alternative A. Cumulative effects of past, present, and reasonably foreseeable future actions under Alternative A on water quality would be similar to the cumulative effects described for soils, since water quality is largely related to soil disturbance. When the adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting water quality are combined with actions under Alternative A, the resulting overall cumulative effects are estimated to be **long- and short-term, minor and adverse**.

Conclusions

Overall, Alternative A is estimated to have **short-term, negligible and adverse effects** on water quality and would parallel the effects described for soils. In addition, under Alternative A, the high quality of water in Fern Lake would continue to be maintained since the watershed would not be disturbed.

Cumulative effects of past, present, and reasonably foreseeable future actions under Alternative A would parallel cumulative effects described for soils. When the adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting water quality are combined with actions under Alternative A, the resulting overall cumulative effects on water quality are estimated to be **long- and short-term, minor and adverse**.

There would be no impairment of water quality or values as a result of park actions under Alternative A.

Impacts of Alternative B

Potential effects on water quality would be related to increased soil erosion during construction activities and increased volumes of storm water runoff from impervious surfaces during operation. The effects of Alternative B on water quality would, therefore, parallel effects described for soils. Implementation of proper siting, design techniques, and best management practices would minimize potentially adverse effects on water quality. Construction and operation of facilities, could potentially affect the water quality of any of the streams in the vicinity of Developed Zones. Streams that could potentially be affected include Yellow Creek, Little Yellow Creek, Gap Creek, Devils Garden Branch, Lewis Hollow Branch, Davis Branch, Sugar Run, Martins Fork Branch, Station Creek, and Shillalah Creek. Water quality in the majority of these streams is good.

Alternative B could potentially increase soil erosion and sediment loading in additional areas of the park as a result of construction and operation of limited new facilities. For example, increased use of trails and/or construction of new trails could result in inadvertent damage or adverse effects on water quality associated with soil compaction, runoff, sedimentation, and vegetation trampling or removal. However, implementation of proper siting, design techniques, and best management practices would minimize adverse effects associated with construction and storm water runoff. The overall effect of Alternative B on water quality would be **long- and short-term, minor and adverse**.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions in Alternative B would be the same as described for Alternative A, except for the addition and operation of seven new small facilities in Alternative B over the long term. Cumulative effects of past, present, and reasonably foreseeable future actions under Alternative B would also parallel cumulative effects described for soils. When the adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting water quality are combined with actions under Alternative B, the resulting overall cumulative effects on water quality are estimated to be **long- and short-term, minor and adverse**.

Conclusions

Construction and operation of the seven new proposed facilities and other facilities in other areas of the park under Alternative B would have **long- and short-term, minor and adverse effects** on water quality. Implementation of proper siting, design techniques, and best management practices would minimize potentially adverse effects on water quality.

When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting water quality are combined with actions under Alternative B, the resulting cumulative effects of Alternative B would be **long- and short-term, minor and adverse**.

There would be no impairment of water quality or values as a result of park actions under Alternative B.

Impacts of Alternative C

As compared to Alternative A, Alternative C would provide for larger and more numerous Developed Zones, a greater potential for new facilities, and increased visitor access. New or enlarged Development Zones would total more than twice the area occupied by areas designated as developed under Alternative A. However, this is not to imply that the entire zone would be developed. Only limited facility development is proposed. Construction of 11 new minor facilities in Developed Zones at the Hensley Settlement, the base of Brush Mountain, Fern Lake, and the Wilderness Road Campground could be completed. These would potentially affect water quality in these areas (see

Chapter 2 for detailed information on proposed facilities). Streams that could potentially be affected include Yellow Creek, Little Yellow Creek, Gap Creek, Devils Garden Branch, Lewis Hollow Branch, Davis Branch, Sugar Run, Martins Fork Branch, Station Creek, and Shillalah Creek. Water quality in the majority of these streams is good. Implementation of proper siting, design techniques, and implementation of best management practices would minimize adverse effects associated with construction and storm water runoff.

Increased use of trails and/or construction of new trails could result in inadvertent damage or adverse effects on water quality associated with soil compaction, runoff, sedimentation, and vegetation trampling or removal. However, implementation of proper siting, design techniques, and implementation of best management practices would minimize adverse effects associated with construction and storm water runoff.

Alternative C also features increased education and outreach programs that would help to further educate the public on issues related to soil erosion and water quality in the park. This would also increase awareness and provide a benefit to resource protection. Increased education and outreach programs could lead to increased participation in trail maintenance programs by the public or by other programs relating to soil conservation. This would have a **moderate, long-term beneficial effect** on water quality in the park.

Prior to construction of new park facilities, site-specific environmental assessments would be prepared that would assess the potential effects of specific sites and designs on water quality. The soil tables provided in Appendix C can be used to define the effects of a given project on soils and sediment loading of streams and water quality, depending on location.

The overall effect of Alternative C on water quality is, therefore, estimated to be **long- and short-term, minor and adverse**.

Cumulative Impacts

Cumulative effects of Alternative C on water quality would be similar to Alternative B. The only difference would be the construction and operation of additional minor facilities under Alternative C (two to three existing campsites would be modified for use by horse trailers). Construction and operation of a few minor additional new facilities within the newly established Developed Zones in the park could also occur. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting water quality are combined with actions under Alternative C, the resulting cumulative effects of Alternative C would be **long- and short-term, minor and adverse**.

Conclusions

The overall effect of Alternative C on water quality would be **long- and short-term, minor and adverse** associated with 11 minor new facilities proposed under Alternative C, and the effects of other projects on water quality would be limited. Implementation of proper siting, design techniques, and best management practices would minimize potentially adverse effects on water quality. Increased levels of education and outreach would also have **moderate, long-term, beneficial effect** on water quality by informing the public about soil erosion and sediment loading issues, and by potentially increasing public participation in trails maintenance programs and dissemination of information on water quality.

When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting water quality are combined with actions under Alternative C,

the resulting cumulative effects of Alternative C on water quality would be **long- and short-term, minor and adverse**.

There would be no impairment of water quality or values as a result of park actions under Alternative C.

FISHERIES/ AQUATIC RESOURCES

Regulations and Policies

Regulations and policies that guide NPS actions with respect to fisheries/aquatic resources are summarized in the “Servicewide Mandates and Policies” section of Chapter 1 and in Appendix B.

Method

This impact topic is included to address potential effects of construction and operation of new facilities on fisheries and aquatic life, particularly at Fern Lake, but also in streams within and adjacent to the park. Potential effects of these actions are primarily related to the potential for increased soil erosion and sediment loading to water bodies during construction and operation of new facilities. Potential effects on fisheries and aquatic resources, therefore, parallel the effects on soils and water quality.

This analysis assumes that effects on fisheries/aquatic resources resulting from implementation of an alternative would be a direct result of construction and operation of park facilities. All effects on fisheries/aquatic resources are also assumed to be local in extent.

Prior to construction of new park facilities, site-specific environmental assessments would be prepared that would assess the potential effects of specific sites and designs on natural and cultural resources. The soil tables provided (Appendix C) may be used to define the effects of projects in the Fern Lake area on soils and sediment loading of streams and Fern Lake, and resulting effects on fisheries and aquatic resources. Detailed information included in Appendix F can also be used to evaluate conditions in individual streams in the vicinity of proposed projects.

Impact thresholds were used to estimate the intensity of each estimated effect on aquatic resources. Thresholds for this impact topic are presented in Table 20.

Table 20. Impact Thresholds for Aquatic Resources

Negligible: Aquatic resources and their habitats would not be affected or else the effects would be at or below the level of detection and would not be measurable or of perceptible consequence to aquatic populations.
Minor: Effects on aquatic resources or habitats would be measurable or perceptible. While the mortality of individual plants and animals might occur, the viability of aquatic populations would not be affected and the community, if left alone, would recover.
Moderate: A change in aquatic populations or habitats would occur and would be readily measurable in terms of abundance, distribution, quantity, or quality of populations. Mitigation measures would be necessary to offset adverse effects and would most likely be successful.
Major: A change in aquatic populations or habitats would occur and would be readily measurable in terms of abundance, distribution, quantity, or quality of populations. Extensive mitigation would be needed to offset adverse effects, and the success of mitigation measures could not be assured.
Duration: Long-term: Effects last more than 1 year. Short-term: Effects last less than 1 year.

Impacts of Alternative A

The only construction proposed under Alternative A is the composting comfort station at Fern Lake, a minor construction project. This would have **short-term, negligible, and adverse effects** on fisheries/aquatic resources associated with soil erosion in the vicinity of Fern Lake. Availability of comfort station facilities at Fern Lake would have a **long-term, minor beneficial effect** on fisheries/aquatic resources of Fern Lake by controlling and treating wastewater.

Increased use of trails, and/or construction of new trails, could occur under Alternative A. This could potentially result in inadvertent damage or adverse localized effects on fisheries/aquatic resources associated with soil compaction, runoff, sedimentation, and vegetation trampling or removal. These effects are expected to be minor, however, and would be mitigated through appropriate trail management. During operation of the park under Alternative A, existing management policies and programs for fisheries/aquatic resources would be continued. These policies and programs require maintenance of soils and minimization of sediment loading to streams in the park along hiking trails, the visitor center, and all other park facilities. During operation, roads, trails, small buildings, and facilities currently present in the area surrounding Fern Lake, would be left in place, and no other new facilities would be constructed. Soil erosion from existing facilities would be minimal and water quality would be expected to remain high, providing quality fisheries and aquatic habitat at Fern Lake.

Under Alternative A, fisheries and aquatic life in the park are expected to be maintained in good overall ecological health. The overall effect of Alternative A on fisheries/aquatic resources is estimated to be **long- and short-term, negligible and adverse**.

Cumulative Impacts

Cumulative effects of Alternative A on fisheries/aquatic resources would parallel the previously described cumulative effects on soils and water quality. Protection of the Fern Lake Watershed and continued maintenance of park facilities provide beneficial effects. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting fisheries/aquatic resources are combined with actions under Alternative A, the resulting cumulative effects of Alternative A would be **long- and short-term, minor and adverse**.

Conclusions

The effects of Alternative A on fisheries/aquatic resources would parallel the effects of construction and operation of the park on soils and water quality as described in previous subsections. The overall effects of Alternative A on fisheries/aquatic resources are estimated to be **long- and short-term, negligible and adverse**.

Cumulative effects of Alternative A would parallel the description of cumulative effects on soils and water quality. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting fisheries/aquatic resources are combined with actions under Alternative A, the resulting cumulative effects of Alternative A would be **long- and short-term, minor and adverse**.

There would be no impairment of fisheries/aquatic resources or values as a result of park actions under Alternative A.

Impacts of Alternative B

The effects of Alternative B on fisheries/aquatic resources would parallel the effects on water quality described previously, since effects on these resources are highly localized and would primarily be related to effects of soil erosion during construction and storm water runoff during operation of new

park facilities. Alternative B would feature seven specific construction projects as well as more generalized plans for construction and operation of future facilities in the various zones established for the park. Implementation of proper siting, design techniques, and best management practices would minimize potentially adverse effects on water quality and fisheries/aquatic resources. The overall effect of Alternative B on fisheries/aquatic resources would be **long- and short-term, minor and adverse**.

Cumulative Impacts

Cumulative effects of Alternative B on fisheries/aquatic resources would be similar to those in Alternative A, because seven minor facilities would be constructed under Alternative B and these would have potentially localized effects on soils and sediment loading to streams and Fern Lake. It is also anticipated that there would be relatively few future facilities in other parts of the park. When the adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting fisheries/aquatic resources are combined with actions under Alternative B, the resulting overall cumulative effect would be **long- and short-term, minor and adverse**.

Conclusions

Because few new facilities would be constructed and operated, the overall effect of Alternative B on fisheries/aquatic resources would be **long- and short-term, minor and adverse**. When the adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting fisheries/aquatic resources are combined with actions under Alternative B, the resulting overall cumulative effect would be **long- and short-term, minor and adverse**.

There would be no impairment of fisheries/aquatic resources or values as a result of park actions under Alternative B.

Impacts of Alternative C

The effects of Alternative C on fisheries/aquatic resources would be similar to those in Alternative B, except that a total of 11 minor facilities would be constructed and operated, and education and outreach programs would be expanded. Expanded education and outreach programs would benefit fisheries/aquatic resources by enhancing visitor awareness of the value of these park aquatic resources. The overall effect of Alternative C on fisheries/aquatic resources would be **short-and long-term, minor and adverse**.

Cumulative Effects

The cumulative effects of Alternative C on fisheries/aquatic resources would be similar to those under Alternative A, except that a total of 11 minor facilities would be proposed for construction under Alternative C. Some additional new facilities could also be constructed in other parts of the park in the future. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting fisheries/aquatic resources are combined with actions under Alternative C, the resulting cumulative effects of Alternative C would be **long- and short-term, minor and adverse**.

Conclusions

Due to the limited number of new facilities anticipated in the park, the overall effect of Alternative C on fisheries/aquatic resources is, therefore, estimated to be **long- and short-term, minor and adverse**. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting fisheries/aquatic resources are combined with actions

under Alternative C, the resulting cumulative effects of Alternative C would be **long- and short-term, minor and adverse**. There would be no impairment of fisheries/aquatic resources or values as a result of park actions under Alternative C.

WETLANDS

Regulations and Policies

Regulations and policies that guide NPS actions with respect to wetlands are summarized in the “Servicewide Mandates and Policies” section of Chapter 1 and in Appendix B.

Method

Wetland protection was identified as an issue since these natural resources could potentially be affected by construction and operation of new park facilities. Potential effects of the management alternatives on wetlands were estimated in two ways: (1) the locations of specific future projects were compared with available wetland maps and a conclusion was made regarding potential effects where possible for a general area; and (2) a more generalized assessment of potential effects on wetlands was completed by defining the types of activities and facilities that could be implemented in each zone and estimating the potential for effects. The National Wetlands Inventory location map was used as the basis for the impact assessment (USFWS 2007b). The majority of new facilities that could potentially affect wetlands would be constructed and operated in the Developed Zone, including the area near Fern Lake.

This analysis assumes that effects on wetlands resulting from implementation of an alternative would be a direct result of construction and operation of park facilities. All effects on wetlands are assumed to be local in extent.

In all cases, the park would adhere to section U.S. Environmental Protection Agency 404(b) (1) guidelines to avoid and minimize potentially adverse effects on wetlands. Restoration or enhancement of wetlands to offset any unavoidable losses would be taken as the last step in this process, as required. In addition, NPS guidelines for mapping and avoiding wetlands would also be followed. The NPS requirements are more restrictive than the U.S. Environmental Protection Agency 404(b) (1) guidelines.

Prior to construction of new park facilities, site-specific environmental assessments would be prepared that would assess the potential effects of specific sites and designs on wetlands. The wetland and soil tables (Appendix E) may be used as an initial step in evaluation effects on wetlands; in addition, formal wetland delineations would be conducted for specific construction projects. Wetlands would be avoided to the maximum extent practicable, according to the requirements of *Director’s Order No. 77-1: Protection of Wetlands* (NPS 2008).

Impact thresholds were used to estimate the intensity of each estimated effect on wetlands. Thresholds for this impact topic are presented in Table 21.

Table 21. Impact Thresholds for Wetlands

Negligible: Wetland habitats would not be affected or else the effects would be at or below the level of detection and would not be measurable or of perceptible consequence to wetland plant and animal populations.
Minor: Effects on wetland habitats would be measurable or perceptible. While mortality of individual plants and animals might occur, the viability of wetland populations and habitats would not be affected and the community, if left alone, would recover.
Moderate: A change in wetland habitats would occur. The change would be readily measurable in terms of abundance, distribution, quantity, or quality of populations of plants and animals. Mitigation measures would be necessary to offset adverse effects and would likely be successful.
Major: Effects on wetland habitats would be readily apparent and measurable. Extensive mitigation would be needed to offset adverse effects, and the success of mitigation measures could not be assured.
Duration: Long-term: Effects last more than 1 year. Short-term: Effects last less than 1 year.

Impacts of Alternative A

Under Alternative A, the only new proposed construction would be the new composting comfort station at Fern Lake. No wetlands would be affected by this project based on a review of available information (USFWS 2007b). No other park actions would adversely affect wetlands under Alternative A. The park would continue to manage and protect wetlands under existing management efforts. Overall, management actions taken under Alternative A would have **long-term, negligible and beneficial effects** on wetlands.

Cumulative Impacts

Management actions taken under Alternative A would have no adverse effects on wetlands in the park since wetlands would be avoided. Construction of projects in the past in the park and surrounding area listed in the “Cumulative Impact Analysis” section, may have affected some wetlands, but the extent and nature of these effects is unknown. Protection of the Fern Lake watershed has long-term, beneficial effects since the watershed and wetlands will avoid potential commercial development.

When the adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting wetlands are combined with actions under Alternative A, the resulting cumulative effects of Alternative A on wetlands are estimated to be **long- and short-term, negligible and beneficial**.

Conclusions

Overall, management actions taken under Alternative A would have **long-term, negligible and beneficial effects** on wetlands.

Construction of past projects in the park and surrounding area listed in the “Cumulative Impact Analysis” section may have affected some wetlands, but the extent and nature of these effects are not known. Protection of the Fern Lake watershed includes preservation of wetlands in the watershed, which is beneficial. When the adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting wetlands are combined with actions under Alternative A, the

resulting cumulative effects of Alternative A on wetlands are estimated to be **long- and short-term, negligible and beneficial**.

There would be no impairment of wetlands or values as a result of park actions under Alternative A.

Impacts of Alternative B

Under Alternative B, construction in the Developed Zone at Fern Lake could potentially affect wooded and emergent wetlands located in the vicinity. These resources would be identified in a site-specific environmental assessment during the design phase of any proposed projects in this or other areas. Since some new, as yet unidentified, facilities could also be constructed and operated in other parts of the park as appropriate by zone, there is also a potential that wetlands in these areas could be affected. These would also be identified prior to construction. In all cases, wetlands would be avoided, and, if not possible, mitigation measures would be used to address the effects. The park would adhere to U.S. Environmental Protection Agency section 404(b)(1) guidelines to avoid and minimize potentially adverse effects on wetlands. Restoration or enhancement of wetlands to offset any unavoidable losses would be taken as the last step in this process, as required. In addition, NPS guidelines for mapping and avoiding wetlands would also be followed. Overall, the effects of Alternative B on wetlands are estimated to be **long- and short-term, minor and adverse** because of the proximity of these habitats to Fern Lake, and the as yet undetermined potential for effects in other areas of the park.

Cumulative Impacts

When the adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting wetlands are combined with actions under Alternative B, the resulting cumulative effects of Alternative B would be **long- and short-term, minor and adverse**.

Conclusions

Overall, the effects of Alternative B on wetlands are estimated to be **long- and short-term, minor and adverse** because of the proximity of these habitats to Fern Lake, and the as yet undetermined potential for effects in other areas of the park.

When the adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting wetlands are combined with actions under Alternative B, the resulting cumulative effects of Alternative B would be **long- and short-term, minor and adverse**.

There would be no impairment of wetlands or values as a result of park actions under Alternative B.

Impacts of Alternative C

The effects of management actions taken under Alternative C would be similar to those in Alternative B. Therefore, the effects of Alternative C on wetlands are estimated to be **long- and short-term, minor and adverse**.

Cumulative Impacts

Cumulative effects of Alternative C on wetlands would be the same as those in Alternative B, **long- and short-term, minor and adverse**.

Conclusions

Overall, the effects of Alternative C on wetlands are estimated to be **long- and short-term, minor and adverse** because of the proximity of these habitats to Fern Lake and because of the as yet undetermined potential for effects in other areas of the park.

When the adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting wetlands are combined with actions under Alternative C, the resulting cumulative effects of Alternative C would be **long- and short-term, minor and adverse**.

There would be no impairment of wetlands or values as a result of park actions under Alternative C.

VEGETATION – NATIVE PLANT COMMUNITIES

Regulations and Policies

Regulations and policies that guide NPS actions with respect to Vegetation –Native Plant Communities, are summarized in the “Servicewide Mandates and Policies” section of Chapter 1 and in Appendix B.

Method

Vegetation in particular native plant communities was identified as an issue since these natural resources could potentially be affected by construction and operation of new park facilities. Potential effects of the management alternatives on vegetation - native plant communities were estimated by comparing the location of plant communities in the park to areas in which construction and operation of new facilities would be most likely to occur. The effects of specific facilities under each alternative are assessed, as well as the more generalized potential effects of activities appropriate by zone. The types of effects evaluated include direct effects of clearing vegetation during construction activities, as well as the potential introduction of non-native species on new trails and parking lots from seeds from hikers’ boots and clothing, dog fur, horse hair and manure, vehicle tires, wind, and trampling of vegetation on social trails. The park would identify and manage non-native plant populations, reducing their effects on native plant communities or possibly eliminating some strands from the landscape, thus improving species composition and habitat quality.

Areas where construction of new facilities could potentially occur would primarily include Developed Zones. The map of native plant communities in the park prepared by the University of Georgia Center for Remote Sensing and Mapping Science (UGA 2007) in Appendix G, was used for this impact assessment.

This analysis assumes that effects on native plant communities resulting from implementation of an alternative could be a direct result of construction and operation of park facilities. All effects on native plant communities are also assumed to be local in extent.

Prior to the construction of new park facilities, site-specific environmental assessments would be prepared that would assess the potential effects of specific sites and designs on native plant communities. Vegetation information provided in Appendix G may be used as an initial step in evaluating effects on vegetation, and a formal survey of site-specific conditions would be conducted for specific construction projects.

Impact thresholds were used to estimate the intensity of estimated effects on vegetation - native plant communities. Thresholds for this impact topic are presented in Table 22.

Table 22. Impact Thresholds for Vegetation - Native Plant Communities

Negligible: Individual native plants may occasionally be affected, but measurable or perceptible changes in plant community size, integrity, or continuity would not occur.
Minor: Effects on native plants would be measurable or perceptible. The natural function and character of the plant community would not be affected and, if left alone, would recover.
Moderate: A change would occur in the natural function and character of the plant community in terms of basic properties (e.g., growth, abundance, reproduction, distribution, structure, or diversity) but not to the extent that the basic properties of the plant community would change.
Major: Effects on native plant communities would be readily apparent and would substantially and permanently change the natural function and character of the plant types.
Duration: Long-term: Effects last more than 1 year. Short-term: Effects last less than 1 year.

Impacts of Alternative A

Under Alternative A, the only new proposed construction would be the new composting comfort station at Fern Lake. Native plant communities could potentially be affected by construction of this facility. No other park actions would adversely affect native plant communities under Alternative A. The park would continue to manage native plant communities under the existing program. Overall, Alternative A would have negligible effects on native plant communities.

Increased use of trails under Alternative A could potentially cause adverse effects on native vegetation due to trampling or removal; however, management efforts would be taken to minimize or avoid such effects. Effects of operation could also include introduction of non-native species on new trails from seeds from hikers' boots and clothing, dog fur, horse hair, manure, and wind. The park would identify and manage non-native plant populations, reducing their effects on native plant communities or possibly eliminating some strands from the landscape, thus improving species composition and habitat quality.

The park would continue to manage native plant communities under the existing resource management program, which calls for minimization of potential adverse effects on these resources, management to control invasive species, and management to preserve the health and diversity of naturally vegetated habitats. The effect of Alternative A on the extent and values of native plant communities in the area is estimated to be **long-term, moderate and beneficial**.

Cumulative Impacts

Restoration of the Wilderness Road has had a highly beneficial effect on vegetation-native plant communities in the park due to planting of over 20,000 trees in Cumberland Gap. Construction of buildings, roads, parking lots, and other facilities in the park (see list in "Cumulative Impact Analysis" section) has resulted in clearing of some native vegetation, but these have been highly localized actions affecting a minor portion of the park.

The majority of the facilities in the park have already been constructed and only one minor facility is planned for the future. Minimal disturbance of vegetation- native plant communities would, therefore, occur in the future under Alternative A.

Operation of the facilities in the park would have negligible adverse effects on vegetation-native plant communities. Increased visitor activity would occur under Alternative A that could affect trails and

could potentially result in the introduction of non-native species on trails from seeds from hikers' boots and clothing, dog fur, horse hair and manure, and wind, and trampling of vegetation on unauthorized trails. The park would continue to manage unauthorized trail usage to avoid adverse effects. The park would identify and manage nonnative plant populations, reducing their effects on native plant communities or possibly eliminating some strands from the landscape, thus improving species composition and habitat quality.

Restoration of Wilderness Road has resulted in a major beneficial effect on vegetation-native plant communities in the park. The non-native plant control program would result in further control of exotic plant species in the park. The composting comfort station project at Fern Lake would have negligible effects on native plant communities. The majority of the park would continue to be managed as Recommended Wilderness and zoned as such, which protects vegetation- native plant communities. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting native plant communities are combined with actions under Alternative A, the resulting cumulative effects of Alternative A on native plant communities are estimated to be **long- term, moderate and beneficial**.

Conclusions

Overall, management actions taken under Alternative A would have **long-term, moderate and beneficial effects** on vegetation - native plant communities because construction of a composting comfort station would cause a minor disturbance and existing programs to protect vegetation in the park would be continued.

Restoration of Wilderness Road has resulted in a major beneficial effect on vegetation-native plant communities in the park. The non-native plant control program would result in further control of exotic plant species in the park. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting native plant communities are combined with actions under Alternative A, the resulting cumulative effects of Alternative A on native plant communities are estimated to be **long- term, moderate and beneficial**.

There would be no impairment of vegetation - native plant communities or values as a result of park actions under Alternative A.

Impacts of Alternative B

Under Alternative B, construction of seven new, minor construction projects at Fern Lake, the Hensley Settlement, and the Wilderness Road Campground could potentially affect native plant communities. These resources would be identified in site-specific environmental assessments. Construction of some new, as yet, unidentified facilities could also potentially affect native plant communities.

Operation of new facilities, such as trails, could also potentially cause trampling of native vegetation along existing trails or newly created unauthorized trails; however, management efforts would be taken to minimize or avoid such effects. Areas where new facilities would be located would be identified during the course of site-specific environmental assessments, and potentially adverse effects of construction and operation would be minimized through proper alternatives analysis, site selection, design, and best management practices. Overall, the effects of Alternative B on vegetation - native plant communities are estimated to be **long- and short-term, minor and adverse** because of the presence of these resources in the Developed Zone, and the as yet undetermined potential for effects in other specific areas of the park.

Cumulative Impacts

Alternative B would result in minor adverse effects on vegetation - native plant communities within the park. Other actions in the park would have cumulative effects similar to the effects of Alternative A. When the adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting vegetation - native plant communities are combined with actions under Alternative B, the resulting cumulative effects of Alternative B would be **long- and short-term, moderate and beneficial**.

Conclusions

The effects of management actions proposed under Alternative B on vegetation - native plant communities, are estimated to be **long- and short-term, minor and adverse** because of the presence of these resources in the Developed Zone, and the as yet undetermined potential for effects in other areas of the park.

Alternative B would result in minor adverse effects on native plant communities within the park. Other actions in the park have had cumulative effects similar to Alternative A. When the adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting vegetation - native plant communities are combined with actions under Alternative B, the resulting cumulative effects of Alternative B would be **long- and short-term, moderate and beneficial**.

There would be no impairment of vegetation - native plant communities or values as a result of park actions under Alternative B.

Impacts of Alternative C

Under proposed management actions in Alternative C, clearing of native plant communities could result from construction and the operation of 11 new minor facilities. However, existing plant communities would be identified in site-specific environmental assessments during the design phase of a proposed project. In addition, some additional vegetation could potentially be affected under Alternative C as a result of construction in other parts of the Developed Zone. Naturally vegetated areas would be identified prior to construction, and potentially adverse effects of construction and operation would be minimized through proper alternatives analysis, site selection, design, and best management practices. The effects of Alternative C on native plant communities are estimated to be **long- and short-term, minor and adverse**.

Cumulative Impacts

Cumulative effects of Alternative C on vegetation - native plant communities would be the same as in Alternative B, because only a limited number of facilities would be constructed and because potentially adverse effects of construction and operation would be minimized through proper alternatives analysis, site selection, design, and best management practices. Cumulative effects of these actions would, therefore, be similar to those under Alternative B, **long- and short-term, moderate and beneficial**.

Conclusions

Overall, the effects of Alternative C on vegetation - native plant communities are estimated to be **long- and short-term, minor and adverse** because only a limited number of facilities would be constructed and because potentially adverse effects of construction and operation would be minimized through proper alternatives analysis, site selection, design, and best management practices.

When the adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting native plant communities are combined with actions under Alternative C, the resulting cumulative effects of Alternative C would be **long- and short-term, moderate and beneficial**.

There would be no impairment of vegetation - native plant communities or values as a result of park actions under Alternative C.

SPECIES OF SPECIAL CONCERN

Regulations and Policies

Regulations and policies that guide NPS actions with respect to Species of Special Concern are summarized in the “Servicewide Mandates and Policies” section of Chapter 1 and in Appendix B.

Method

Protection of species of special concern were identified as an issue since these natural resources could potentially be affected by construction and operation of new park facilities and visitor use. The assessment of effects of the alternatives on species of special concern is a qualitative prediction of the expected changes in habitat for listed plants and animals that might occur as a result of construction, operation, and use of new park facilities by visitors. The analysis includes those species that have been identified as occurring in the park, as summarized in Table 12 of Chapter 3, “Affected Environment.”

Effects on federally listed species are defined specifically for each plant or animal in detail, based on the expected location of future potential construction projects in the park under each alternative. This analysis assumes that effects on federal-listed species of special concern resulting from implementation of an alternative would be a direct result of construction and operation of park facilities and/or changes in visitor use. All effects on species of special concern are also assumed to be local in extent.

In addition to federally listed species, a large number of State-listed species and other species listed by the Natural Heritage Program also occur in the park. A general qualitative assessment is provided for these species. A detailed assessment of all species of special concern, including site-specific surveys, would be completed as part of site-specific environmental assessments for individual proposed projects in the future. In addition, efforts to document and protect these species’ populations currently present in the park would be completed. Restoration and /or monitoring plans would be developed as warranted. As part of the environmental assessments, plans include methods for implementation, performance standards, monitoring criteria, and adaptive management techniques.

Impact thresholds are used to estimate the intensity of each estimated effect on species of special concern. The intensity of the effect is described according to both the NPS and U.S. Fish and Wildlife Service procedures. Thresholds for this impact topic are presented in Table 23.

Table 23. Impact Thresholds for Species of Special Concern

Negligible: No federal- or territorial-listed species would be affected, nor would the action affect an individual of a listed species or its critical habitat, but the change would not be of any measurable or perceptible consequence to the protected individual or its population. Negligible effect would equate with a “no effect” USFWS determination.
Minor: The action would result in detectable impacts to an individual (or individuals) of a federally or territorially listed species or its critical habitat, but they would not be expected to result in substantial population fluctuations and would not be expected to have any measurable long-term effects on species, habitats, or natural processes sustaining them. Minor effects would equate with a “may affect/not likely to adversely affect” USFWS determination.
Moderate: An action would result in detectable impacts on individuals or population of a federally or territorially listed species, critical habitat, or the natural processes sustaining them. Key ecosystem processes may experience disruptions that could result in population or habitat condition fluctuations that would be outside the range of natural variation (but would return to natural conditions). Moderate level adverse effects would equate with a “may affect/likely to adversely affect/adversely modify critical habitat” USFWS determination.
Major: Individuals or population of a federally or territorially listed species, critical habitat, or the natural processes sustaining them would be measurably affected. Key ecosystem processes might be permanently altered resulting in changes in population numbers that could affect the vitality of the population and permanently modify critical habitat. Major adverse effects would equate with a “may affect/likely to adversely affect/adversely modify critical habitat” USFWS determination.
Duration: Long-term: Effects last more than 1 year. Short-term: Effects last less than 1 year.

Impacts of Alternative A

Table 24 provides a summary of the effects of the alternatives on the four federally listed species known to occur in the park. These include the endangered Indiana bat (*Myotis sodalis*) (Endangered), the gray bat (*Myotis grisescens*), the Red-cockaded woodpecker (*Picoides borealis*), and the threatened blackside dace (*Phoxinus cumberlandensis*). The Yellow-billed cuckoo (*Coccyzus americanus*) is listed as a Candidate Species by the U.S. Fish and Wildlife Service and is not formally listed.

Under Alternative A, species of special concern in the park would continue to be managed as they currently are. The only new construction project in the park under Alternative A would include the construction of a composting comfort station at Fern Lake, which would not have any effects on species of special concern. Because no new facilities are proposed other than the construction of a composting comfort station at Fern Lake, Alternative A would have no effects on federally listed species due to construction activities. This would equate a “no effect” determination as defined by the U.S. Fish and Wildlife Service. In addition, preservation of the Fern Lake watershed would have beneficial effects on the Indiana bat, gray bat, and blackside dace, as summarized in Table 24.

A total of 14 other State-listed species of plants and animals, and 31 other species of plants and animals listed by the Natural Heritage Program, occur in a variety of habitats in the park (Table 12 in Chapter 3, “Affected Environment” section). These species occur in a wide variety of aquatic and terrestrial habitats. Because no new construction would be proposed under Alternative A, other than the Fern Lake composting comfort station (which would have no effect on these species), there would be no adverse effects.

Table 24. Potential Effects of the Alternatives on Federally Listed Species Reported From Cumberland Gap National Historical Park

Common and Scientific Name	Status	Effects of Alternative		
		Alternative A – No Action	Alternative B	Alternative C
Indiana bat (<i>Myotis sodalis</i>)	E	<p>No new construction would occur under Alternative A. New construction would, therefore, have no adverse effect on the Indiana bat.</p> <p>Visitor use of the Fern Lake watershed is expected to experience an increase under this alternative. However, this is not expected to have an adverse effect on Indiana bats that might roost in the area since the amount of visitor activity is expected to be moderate, and no trees would be removed. Protection of the Fern Lake watershed could potentially result in a beneficial effect on the Indiana bat due to the protection of summer roost trees.</p> <p>Current management practices for the Indiana bat in the park would be continued.</p> <p>Education and outreach programs regarding protected species would remain at present levels, and would provide a beneficial effect on this species by making the public more aware of its occurrence in the park and of its specialized habitat requirements.</p> <p>Alternative A would result in a long- and short-term, negligible and adverse effect, which would equate with a “no effect” USFWS determination.</p>	<p>Construction and operation of proposed new facilities in wooded areas within several miles of Gap Cave, including Fern Lake, have a potential to affect summer roosting trees of the Indiana Bat. Construction of new facilities elsewhere in the park could also potentially affect this species. However, surveys would be completed prior to construction to determine whether the species is present and to assure that no adverse effects would occur.</p> <p>Preservation of the Fern Lake watershed could potentially result in a beneficial effect on the Indiana bat due to the protection of summer roost trees.</p> <p>Protection of the Indiana bat and bat habitat in the park would continue to occur under Alternative B.</p> <p>Alternative B would result in a long-term, minor, adverse effect, which would equate with a “may affect/not likely to adversely affect” USFWS determination.</p>	<p>Effects would be similar to those in Alternative B, except expansion of education and outreach programs would benefit the Indiana bat by making the public more aware of its habitat in the park and its specialized requirements. In addition, formalized caving partnering programs would involve increased visitor activity and research and knowledge of the caves. All activities would be managed according to established a cave management plan to assure protection of the Indiana bat. The plan calls for continued research on this species.</p> <p>Alternative C would result in an overall long-term, minor, adverse effect, which would equate with a “may affect/not likely to adversely affect” USFWS determination.</p>

Table 24. Potential Effects of the Alternatives on Federally Listed Species Reported From Cumberland Gap National Historical Park
(Continued)

Common and Scientific Name	Status	Effects of Alternative		
		Alternative A – No Action	Alternative B	Alternative C
Gray bat (<i>Myotis grisescens</i>)	E	<p>If present, the gray bat could potentially use Fern Lake as a feeding area and Gap Cave for roosting. No new facilities would be constructed at Fern Lake; however, preservation of the Fern Lake watershed could potentially benefit the gray bat through protection of open water feeding areas. Caves would continue to be managed to protect the Gray bat and other listed species.</p> <p>Visitor use of the Fern Lake watershed is expected to experience an increase under all the alternatives. However, this is not expected to have an adverse effect on gray bats that might feed in open waters of the lake vicinity since the amount of visitor activity is expected to be moderate, and the types of activities would not be expected to change. Preservation of the Fern Lake watershed could potentially benefit the gray bat due to the protection of summer roost trees.</p> <p>If discovered in Gap Cave, procedures already established in the USFWS Recovery Plan for the Gray bat would be followed.</p> <p>Education and outreach programs regarding protected species would remain at present levels and would provide a continued benefit to this species.</p> <p>Alternative A would result in an overall long- and short-term negligible adverse effect, which would equate with a “no effect” USFWS determination.</p>	<p>Effects would be similar to those in Alternative A, except that limited construction of new facilities would occur in the vicinity of Fern Lake. However, since the gray bat feeds in open water areas, these limited new facilities around the edge of Fern lake would have long-term, negligible and adverse effects on the gray bat. Preservation at the Fern Lake watershed could be expected to benefit the gray bat by preserving the water quality of Fern Lake and the surrounding watershed.</p> <p>Alternative B would result in long-term, negligible adverse effect, which would equate with a “no effect” USFWS determination.</p>	<p>Effects would be similar to those in Alternative A, except that expansion of education and outreach programs would benefit the gray bat by making the public more aware of its occurrence in the park and of its specialized requirements.</p> <p>In addition, formalized caving partnering programs would involve increased visitor activity in the caves. However, all activities would be managed according to an established cave management plan to assure protection of the gray bat, if present.</p> <p>Alternative B would result in an overall long-term, minor adverse effect, which would equate with a “may affect/not likely to adversely affect” USFWS determination.</p>

Table 24. Potential Effects of the Alternatives on Federally Listed Species Reported From Cumberland Gap National Historical Park (Continued)

Common and Scientific Name	Status	Effects of Alternative		
		Alternative A – No Action	Alternative B	Alternative C
Red-cockaded woodpecker (<i>Picoides borealis</i>)	E	<p>No new construction would occur under Alternative A that could affect the red-cockaded woodpecker. No changes in operation of the park would occur under Alternative A that would change the habitat or that would otherwise directly affect red-cockaded woodpeckers.</p> <p>Alternative A would result in an overall long- and short-term, negligible, adverse effect, which would equate with a “no effect” USFWS determination.</p>	<p>Limited new construction in the park could potentially affect the red-cockaded woodpecker, but site-specific environmental assessments would be done to determine the potential for this species or its habitat to be present and impacts would be avoided. The majority of the park would continue to be managed as Recommended Wilderness and zoned as such, thereby protecting red cockaded woodpecker habitat.</p> <p>Alternative B would result in an overall long-term, negligible adverse effect, which would equate with a “no effect” USFWS determination.</p>	<p>Limited new construction in the park could potentially affect the red-cockaded woodpecker, but site-specific environmental assessments would be done to determine the potential for this species or its habitat to be present.</p> <p>Expansion of education and outreach programs would benefit the red-cockaded woodpecker by making the public more aware of its occurrence in the park and of its specialized requirements.</p> <p>Alternative C would result in an overall long-term, negligible adverse effect, which would equate with a “no effect” USFWS determination.</p>
Blackside dace (<i>Phoxinus cumberlandensis</i>)	T	<p>Davis Branch is an important refuge stream for the blackside dace. Davis Branch would not be affected by Alternative A, since no new construction would occur in this area, or in areas with similar characteristics elsewhere in the park. No changes in the ecological condition of Davis Branch or other streams in the park that provide habitat for this species are expected to occur under Alternative A.</p> <p>Alternative A would result in an overall long- and short-term negligible adverse effect, which would equate with a “no effect” USFWS determination.</p>	<p>Davis Branch is an important refuge stream for the blackside dace. Davis Branch would not be affected by Alternative B, since no new construction would occur in this area, or in areas with similar characteristics elsewhere in the park. No changes in the ecological condition of Davis Branch or other streams in the park that provide habitat for this species are expected to occur under Alternative B.</p> <p>Alternative B would result in an overall long- and short-term negligible adverse effect, which would equate with a “no effect” USFWS determination.</p>	<p>Effects would be similar to those in Alternative B, except that the expansion of education and outreach programs would benefit the blackside dace by making the public more aware of its occurrence in the park and of its specialized requirements.</p> <p>Alternative C would result in an overall long- and short-term negligible adverse effect, which would equate with a “no effect” USFWS determination.</p>

Overall, management actions taken under Alternative A would result in **long- and short-term, negligible, adverse** effects on federally listed species, state-listed species, and species listed by the Natural Heritage Program. For federal species, this would equate with a “no effect” determination by the U.S. Fish and Wildlife Service.

Cumulative Impacts

Past actions that most likely affected species of special concern inside and outside the park, would include declaration of the Fern Lake watershed as being unsuitable for coal mining (Federal Register: September 23, 1996), construction of the Wilderness Road preservation project, and construction at nearby state parks (Wilderness Road State Park, Pine Mountain State Park). Prevention of coal mining in the Fern Lake area had a beneficial effect on species of special concern by maintaining natural habitats in the entire watershed. Acquisition of the Fern Lake watershed preserved a major portion of the watershed and prevents development or other land disturbing activities. During construction of the Wilderness Road project, an assessment of the effects on species of special concern was conducted and it was concluded that the project had no adverse effects. Mitigative measures would be used to address species of concern as appropriate during environmental assessment of this proposed project.

Projects in the park or surrounding area that could affect species of concern include the multi-laning of U.S. 25E between I-81 and I-75. Multi-laning of U.S. 25E would result in soil erosion during construction and clearing of vegetation. These effects would be minimized by implementation of best management practices. The multi-laning project would also result in increased storm water runoff to creeks in the vicinity, with an increase in the potential for soil erosion. Proper highway storm water design would help minimize these effects.

Continued management of the majority of the park as Recommended Wilderness and Zoned as such would continue to protect species of concern and their habitats.

The park would continue to provide habitat for protected species and manage these protected resources into the future. When the adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting federally listed species, state-listed species, and species listed by the Natural Heritage Program are combined with actions under Alternative A, the resulting cumulative effects of Alternative A would be **long- and short-term, minor and adverse**. For federal species, this would equate with a “may affect/not likely to adversely affect” determination by the U.S. Fish and Wildlife Service.

Conclusions

Alternative A would result in **long- and short-term, negligible adverse** effects on federally listed species, state-listed species, and species listed by the Natural Heritage Program. For federal species, this would equate with a “no effect” determination by the U.S. Fish and Wildlife Service. When the adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting federally listed species, state-listed species, and species listed by the Natural Heritage Program are combined with actions under Alternative B, the resulting cumulative effects of Alternative A would be **long- and short-term, minor and adverse**. For federal species, this would equate with a “may affect/not likely to adversely affect” determination by the U.S. Fish and Wildlife Service. There would be no impairment of species of special concern as a result of park actions under Alternative A.

Impacts of Alternative B

Table 23 summarizes the specific estimated potential effects of Alternative B on federally listed species. Construction of the seven new specific facilities in Developed Zones under Alternative B could potentially adversely affect these species (Table 23). Additional and as yet unidentified construction of

other new facilities in the Developed Zone under Alternative B could also potentially affect federally listed species (Table 23). Preservation of the Fern Lake watershed could have long-term, beneficial effects for the Indiana bat and gray bat (Table 23). Continued protection of habitat and management efforts in the park would provide long-term beneficial effects. Site-specific surveys for these species and detailed impact assessments would also be conducted as part of environmental assessments completed for individual construction projects in the future. Any mitigation required to protect these species would be identified at that time to avoid any adverse effects.

A total of 14 additional state-listed species of plants and animals and 31 additional species of plants and animals listed by the Natural Heritage Program are known to occur in a variety of habitats in the park (see Table 12 in Chapter 3). The effects of Alternative B on these species are not described in detail in this general management plan, but would also be related to the specific location and types of new facilities that would be constructed and operated in the park in the future. The potential for adverse effects would be greatest in Developed Zones, since these areas would be potentially subject to land clearing and soil disturbing activities. However, site-specific surveys for these species would also be conducted as part of environmental assessments for individual projects in the future, and surveys; avoidance and mitigation would be addressed.

The effect of Alternative B on the red cockaded woodpecker and the gray bat would be **long-term, negligible and adverse**, which would equate to a “no effect” USFWS determination. The effect of Alternative B on the Indiana bat would be a **long-term, minor, adverse** effect, which would equate to a “may affect, not likely to adversely affect” determination. The effect on the blackside dace would be a long-and short-term, negligible, adverse effect which would equate with a “no effect” USFWS determination.

Cumulative Impacts

The park would continue to provide habitat for protected species and manage these protected resources into the future. When the adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting federally listed species, state-listed species, and species listed by the Natural Heritage Program are combined with actions under Alternative A, the resulting cumulative effects of Alternative B would be **long-term, minor and adverse**. For federal species, this would equate with a “may affect/not likely to adversely affect” determination by the U.S. Fish and Wildlife Service.

Conclusions

The effect of Alternative B on the red cockaded woodpecker and the gray bat would be **long-term, negligible and adverse**, which would equate to a “no effect” USFWS determination. The effect of Alternative B on the Indiana bat would be a **long-term, minor, adverse** effect, which would equate to a “may affect, not likely to adversely affect” determination. The effect on the blackside dace would be a long-and short-term, negligible, adverse effect which would equate with a “no effect” USFWS determination.

When the adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting species of special concern are combined with actions under Alternative B, the resulting cumulative effects of Alternative B would be similar to Alternative A, **long-term, minor and adverse**. For federal species this equates to, which would equate to a “may affect/not likely to adversely affect” USFWS determination.

There would be no impairment of species of special concern or values as a result of park actions under Alternative B.

Impacts of Alternative C

The effects of Alternative C on species of special concern would be similar to those in Alternative B, except that 11 new minor facilities would be constructed in Alternative C. However, these would be minor facilities and would be sited according to the requirements of the National Environmental Policy Act to assure avoidance of effects on species of special concern. The potential for adverse effects on species of special concern would, therefore, be similar to that in Alternative B. In addition, increased partnering, education, and outreach under Alternative C would provide beneficial effects due to increased visitor awareness and sensitivity to species protection. The overall result would be a **long-term, minor adverse effect** on species of special concern, which equates to a “may affect/not likely to adversely affect” U.S. Fish and Wildlife Service determination for federal species.

Cumulative Impacts

Cumulative effects of management actions proposed under Alternative C on species of special concern would be the same as those under Alternative B, **long-term, minor and adverse**. For federal species this equates to a “may affect/not likely to adversely affect” U.S. Fish and Wildlife service determination.

Conclusions

The effects of Alternative C on species of special concern would be similar to those in Alternative B, except that increased partnering, education, and outreach would provide beneficial effects due to increased visitor awareness and sensitivity toward species protection. The overall result would be a **long-term, minor adverse effect** on species of special concern, which equates to a “may affect/not likely to adversely affect” U.S. Fish and Wildlife Service determination.

Cumulative effects of Alternative C on species of special concern would be the same as those in Alternative B. Cumulative effects of management actions proposed under Alternative C on species of special concern would be the same as those under Alternative B, **long-term, minor and adverse**. For federal species this equates to a “may affect/not likely to adversely affect” U.S. Fish and Wildlife service determination.

There would be no impairment of species of special concern as a result of park actions under Alternative C.

SOUNDSCAPE

Regulations and Policies

Regulations and policies that guide NPS actions with respect to soundscape are summarized in the “Service-wide Mandates and Policies” section of Chapter 1 and in Appendix B.

Method

Protection of the soundscape of the park was identified as an issue during the public scoping process. The area analyzed for possible effects on soundscape includes the park and the area immediately surrounding the park. The major assumptions used in the analysis were: (1) no sound measurements were recorded for this analysis, therefore, a qualitative analysis was prepared instead of a quantitative analysis; (2) additional visitation and more extended visitation would result in additional noise, particularly in Developed Zones of the park; (3) Developed Zones that result in more facilities being constructed would result in additional noise during construction, operation, maintenance, and use; (4) construction of new facilities would result in short-term noise impacts; (5) maintenance of grounds and facilities often require use of power tools that create noise during use; (6) actions outside the park

that are beyond the jurisdiction of the NPS can result in increased noise levels inside the park; and (7) the western end of the park, located adjacent to the Middlesboro–Harrogate urbanized area, would experience higher levels of noise than would the eastern end of the park, which is surrounded by more rural land.

Impact thresholds used for estimating the intensity of different types of effects on soundscape are presented in Table 25.

Table 25. Impact Thresholds for Soundscape

Negligible: Human-caused or project specific sounds do not compete with ambient sounds. Where noise is audible, it is for a short duration, with significantly lengthy periods of time that are noise-free.
Minor: Human-caused or project sounds are detectable above ambient sounds; however, there are frequent periods of time that are noise-free.
Moderate: Human-caused or project sounds compete with ambient sounds. The noise generated is perceptible; however, there are short periods of time that are noise-free.
Major: Human-caused sounds dominate the soundscape and replace natural sounds. Natural sounds in the project area are commonly impacted by noise from management or recreational activities for most of the day without periods of time that are noise free.
Duration: Long-term: Takes more than one year to recover. Short-term: Recovers within one year.

Impacts of Alternative A

Under Alternative A, effects on soundscape would be limited because other than a proposed composting comfort station at Fern Lake, no new facilities would be constructed and operated. The size of the existing Development Zones (using the terminology for zones defined in the 1979 plan) would remain unchanged and facilities in these areas would require no additional routine maintenance. The soundscape at the Hensley Settlement and other historic features of the park would be expected to be maintained, with the infrequent sounds of visitors and the solitude that the historic setting offers preserved. The exception to this would be during special events when more visitors are likely to be present, park staff are engaged in living history activities, and associated sounds would be expected to be heard. Therefore, sound levels would remain near current levels throughout the park.

Continuation of existing levels of education and outreach and continuation of existing levels of informal partnering with caving groups, educational institutions, Daughters of the American Revolution, Wilderness Road State Park, and other organizations, would maintain current levels of use of the park, which would also maintain visitation levels at the park. Therefore, human-created sound levels associated with these activities would remain near current levels under Alternative A.

The overall effect of Alternative A on the soundscape would be **long-and short-term, negligible, and adverse**.

Cumulative Impacts

Past projects in the park, listed in Chapter 2, have attracted additional visitors to the park and could encourage a longer stay in the park. These actions have attracted, and will continue to attract, additional visitors who would add human-related noise to the soundscape of the park. The construction of facilities also resulted in additional noise in the park. The multi-laning of U.S. 25E allows for additional visitors to the U.S. 25E Cumberland Gap tunnel, located inside the park, and has

also created additional noise. While the additional traffic increased noise levels in the area surrounding the tunnel, most of the noise created by road traffic is confined to the tunnel area and only the loudest trucks and motorcycles can be heard from more interior areas of the park, including Pinnacle Overlook.

Relocation of the “Glacier Girl” away from the Middlesboro-Bell County Airport resulted in a slight noise reduction in the park during the few times each year that the plane took off or landed near Pinnacle Overlook.

Declaration of the Fern Lake watershed as being unsuitable for coal mining (Federal Register: September 23, 1996) resulted in less mining in the vicinity of the park that resulted in fewer trucks and employee vehicles on the road and, therefore, less noise. Protection of the Fern Lake Watershed and zoning of the Recommended Wilderness preserved the natural soundscape in a majority of the park.

When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting the soundscape are combined with actions under Alternative A, the resulting cumulative effects would be **long- and short-term, minor, and adverse**.

Conclusions

The overall effect of management actions taken under Alternative A on the park’s soundscape would be **long- and short-term, negligible, and adverse**. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting transportation are combined with actions under Alternative A, the resulting cumulative effects would be **long- and short-term, minor and adverse**.

There would be no impairment of soundscape or values as a result of park actions under Alternative A.

Impacts of Alternative B

Under Alternative B, a few minor facilities could be constructed within the proposed Developed Zone, which is approximately two times larger than the Developed Zone in Alternative A. Construction of a limited number of new facilities could occur in Developed Zones at Fern Lake, the Park headquarters area, Sugar Run, the Wilderness Road Campground/Gap area, and the Hensley Settlement. Creation of a new Developed Zone at Fern Lake could result in construction and operation of a limited number of new park facilities in this area. This would provide opportunities for fishing and non-motorized and electric trolling motor boating for visitors to the park. Therefore, human created sound levels could increase beyond levels associated with Alternative A.

The new Developed Zones on the east and west sides of the Hensley Settlement could result in additional noise in these areas. For example, there could be additional guided tours and other activities at Hensley Settlement, as well as improved access, via a new parking facility, at the base of Brush Mountain. In addition, improvements made to Shillalah Creek Road, near the Hensley Settlement, would also have improved access and additional visitors. Recreational vehicle capacity of the campground would be increased by adding one electrical loop. Some minor projects could also be constructed in other parts of the park. These facilities could be utilized by visitors for their enjoyment and education. Facility improvements could attract additional visitors to the park, which would increase the noise level. In addition, there would be more areas that would require periodic maintenance, including maintenance with power machinery. This would add to the existing human-caused sound levels in the Developed Zones and would result in higher noise levels as compared to levels in Alternative A. In addition, any construction that would occur would elevate man-made sounds in the area during the construction period.

The levels of education, outreach, and partnering would be the same as those described for Alternative A. The effects of these activities on soundscape would be the same as those described for Alternative A.

The overall effect of management actions proposed under Alternative B on soundscape would be **long- and short-term, minor, and adverse**.

Cumulative Impacts

Cumulative effects of Alternative B on soundscape would be the same as those identified for Alternative A, **long- and short-term, minor, and adverse**. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting the soundscape are combined with actions under Alternative B, the resulting cumulative effects would be **long- and short-term, minor, and adverse**.

Conclusions

The overall effect of management actions proposed under Alternative B on soundscape would be **long- and short-term, minor, and adverse**. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting soundscape are combined with actions under Alternative B, the resulting cumulative effects would be **long- and short-term, minor, and adverse**.

There would be no impairment of soundscape or values as a result of park actions under Alternative B.

Impacts of Alternative C, the Preferred Alternative

The effects of Alternative C would be similar to those described for Alternative B. However, expansion of the existing levels of education, outreach, and partnering would result in increased levels of visitor use, which could increase visitation to the park. As more visitors and special events are anticipated than in Alternative A, human-related sound levels could increase above the levels associated with Alternative A. Human-generated noise would be short-term and associated primarily with special events. The overall effect of Alternative C on soundscape would primarily be **long- and short-term, minor, and adverse**.

Cumulative Impacts

Cumulative effects of Alternative C on soundscape would be the same as those identified for Alternative A. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting the soundscape are combined with actions under Alternative C, the resulting cumulative effects would be **long- and short-term, minor, and adverse**.

Conclusions

The overall effect of Alternative C on soundscape would be **long- and short-term, minor and adverse**. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting transportation are combined with actions under Alternative C, the resulting cumulative effects would be **long- and short-term, minor and adverse**.

There would be no impairment of soundscape or values as a result of park actions under Alternative C.

CULTURAL RESOURCES

This section assesses the potential effect of the alternatives on cultural resources. These include archeological resources, cultural landscapes, historic districts, historic buildings and structures, and ethnographic resources. Despite the fact that none of the landscapes at Cumberland Gap National Historical Park have been formally inventoried or designated as cultural landscapes, it seems apparent that at least two historic areas of the park – the Hensley Settlement and Cumberland Gap Historic District – include many characteristics of a cultural landscape. Other areas in the park also contain elements of cultural landscapes reflecting the Civil War, industrial development, and early settlement. The impacts on these potential cultural landscapes are therefore assessed under the Cultural Landscapes impact topic.

Regulations and Policy

The regulations and policies that guide NPS actions with respect to historic and cultural resources are summarized in the “Servicewide Mandates and Policies” section of Chapter 1 and in Appendix B. Regulations for implementing the National Environmental Policy Act and the National Historic Preservation Act require the analysis of the effects of proposed actions on important cultural resources. Unfortunately, each of the acts has a different set of definitions for assessing effects on cultural resources. To comply with the requirements of both of the acts, this general management plan and environmental impact statement uses both sets of definitions to evaluate effects on the cultural resources of Cumberland Gap National Historical Park.

Method

Protection of the cultural resources while providing increased access in the park was identified as an issue during the public scoping process. The following method summarizes how potential effects on these resources were assessed according to the requirements of the National Historic Preservation Act and the National Environmental Policy Act. The following discussion is an attempt to correlate the differing requirements of the two acts in a way that impacts (affects) cultural resources; they are presented in a thorough, thoughtful, and meaningful manner and compliance with both laws is achieved. For these reasons, the impact criteria for cultural resources are presented in a different format from the other impact topics in this general management plan/environmental impact statement.

Section 106 Methodology

To implement Section 106 of the National Historic Preservation Act, the Advisory Council on Historic Preservation (Advisory Council) has published regulations at 36 Code of Federal Regulations 800. These regulations, entitled “Protection of Historic Properties”, provide guidance for determining whether a *historic property* (defined as any prehistoric district, site, building, structure, or object included in, or eligible for inclusion in the National Register [NHPA Section 301 (5) and 36 Code of Federal Regulations 800.16(1)(1)]) is eligible for inclusion on the National Register of Historic Places (National Register) and provides a procedure for nominating such properties to the register.

The regulations also explain what constitutes an impact or effect on a historic property listed on or eligible to be listed on the National Register. In accordance with 36 Code of Federal Regulations 800, the effects on archeological resources, ethnographic resources, historic buildings and structures, and cultural landscapes were identified and evaluated by:

- Determining the area of potential effects;
- Identifying historic property/ies present in the area of potential effects that are either listed in or are potentially eligible to be listed in the National Register;

- Applying the criteria of adverse effect to all the listed or potentially eligible cultural resources that could be affected; and
- Considering ways to avoid, minimize, or mitigate adverse effects.

This general management plan identified, evaluated, and assessed the effects on historic properties using three possible results from the 36 Code of Federal Regulations 800 regulations that implement Section 106. Those possible results are:

- A determination of no historic properties affected means that either there are no historic properties present or there are historic properties present but the undertaking will have no effect on them (36 Code of Federal Regulations 800.4(d)(1));
- A determination of no adverse effect means there is an effect, but that effect would not meet the criteria of an adverse effect; that is, it will not diminish the characteristics of the cultural resource that qualify it for inclusion in the National Register (36 Code of Federal Regulations 800.5(b));
- An adverse effect occurs whenever an impact alters, directly or indirectly, any characteristic of a cultural resource that qualifies it for inclusion in the National Register. For example, this could include diminishing the integrity of its location, design, setting, materials, workmanship, feeling, or association. Adverse effects also include reasonably foreseeable effects caused by the alternatives that would occur later in time, be farther removed in distance, or be cumulative (36 Code of Federal Regulations 800.5(a) (1)).

Because cultural resources are nonrenewable, all adverse effects on National Register-eligible cultural resources in Cumberland Gap National Historical Park would be long-term and would have a high level of concern.

A Section 106 summary follows the cultural resource impact analysis presented according to the requirements of the National Environmental Policy Act. The Section 106 summary is intended to meet the requirements of the National Historic Preservation Act and is an assessment of the effect of the undertaking (implementation of the alternative) of cultural resources, based on criteria of the effect and adverse effect in the Advisory Council's regulations.

National Environmental Policy Act Assessment Methodology

The assessment of effects of the alternatives on cultural resources within the area of potential effect was based on a comparison of conditions under each alternative to Alternative A, the No Action Alternative. Context, intensity, and duration of potential impacts on cultural resources were assessed using criteria established in a set of thresholds developed for each impact topic. Thresholds used for assessing potential impacts on cultural resources are presented in the following sections, and include both National Environmental Policy Act and National Historic Preservation Act terminology. Alternatives involving higher levels of physical disturbance/change in relation to Alternative A, the No Action Alternative, have a higher potential to adversely affect cultural resources.

Thresholds were used to estimate these effects. Thresholds for each of the impact topics were based on different criteria as follows:

- **Archeological Resources Eligible for/Listed on the National Register of Historic Places:** Thresholds are based on a variety of criteria, including data retrieval potential, degree of expected disturbance, whether or not preservation would occur, number of sites, and size of the site (including whether the affected area is a District).
- **Cultural Landscapes, Historic Buildings, Structures and Districts Listed in or Eligible for the National Register of Historic Places:** The potential for an alternative to diminish the significance or integrity of the resource(s) to the extent that their National Register eligibility is affected was

used as the primary criterion for estimating effects. Beneficial effects were assessed based on the potential to maintain, preserve, or stabilize resources.

- **Ethnographic Resources (Including Traditional Cultural Properties and Values) Listed in or Eligible for the National Register of Historic Places:** The potential to alter resource conditions such as traditional access or site preservation, or the relationship between the resource and the affiliated group's body of beliefs and practices was used as the primary criterion for estimating effects. Beneficial effects of a proposed action were based on the potential to enhance traditional access and/or accommodate a group's traditional practices or beliefs.

For purposes of Section 106, each set of thresholds also includes an equivalent determination of effect based on the requirements and definitions used under the National Historic Preservation Act. Thresholds and associated criteria for evaluation of impact intensity for this plan have been used in previous NPS projects.

For purposes of the impact analysis for cultural resources in this document, lands within the park boundaries and within the confines of the Fern Lake watershed acquisition are considered the area of potential effect. Effects on virtually all cultural features other than vegetation components were considered to be long-term effects because most cultural resources are non-renewable. These would include any effects on archeological, historic, or on non-vegetation elements of a cultural landscape.

For historic resources, it was also assumed that development and implementation of resource inventories and other cultural resource-related plans (see Chapter 2) would help avoid, minimize, or reduce the potential adverse effects of NPS actions. Typical mitigation measures are described in Table 9 "Summary of Mitigation Measures and Best Management Practices" in Chapter 2. Historic resources would be managed to maintain their resource condition and character. All stabilization/preservation of historic features/structures/landscapes would be conducted in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties and character, in accordance with relevant Cultural Landscape Report(s) and Historic Structure Report(s). Studies to identify historic properties and assess effects would be carried out in advance of undertakings and would comply with the requirements of Sections 106 and 110 of the NHPA, 36 Code of Federal Regulations 60, 36 Code of Federal Regulations 800, and NPS Director's Order 28.

The Council on Environmental Quality (1978) regulations for implementing the National Environmental Policy Act and Director's Order 12 (NPS 2001b) call for a discussion of the appropriateness of mitigation with an analysis of how effective the mitigation would be in reducing the intensity of a potential impact (for example, reducing the intensity of an impact from major to moderate or minor). However, any reduction in intensity of impact from mitigation is an estimate of the effectiveness of mitigation *only* under the National Environmental Policy Act. The level of effect as defined by Section 106 is *not* similarly reduced, because cultural resources are nonrenewable and adverse effects that consume, diminish, or destroy the original historic materials or form, will result in a loss in the integrity of the resource that can never be recovered. Therefore, even if actions determined to have an adverse effect under Section 106 may be mitigated, the effect remains adverse.

Impacts of Alternative A on Archeological Resources

Certain important questions about human history can only be answered by the actual physical material of cultural resources. Archeological resources have the potential to answer, in whole or in part, such questions. An archeological site can be eligible for listing in the National Register of Historic Places Criterion D if the site has yielded, or is likely to yield, information important to prehistory or history. Criterion D encompasses the properties that have the potential to answer, in whole or in part, those types of research questions (NPS 1995). An archeological site can be nominated to the National Register of Historic Places in one of three historic contexts or levels of significance: local, state, or national (NPS 2002c).

Laws and regulations applicable to archeological resources, the method used to analyze potential impacts of an action, and the area of potential effect are described above. For archeological resources, until a National Register evaluation for any site is completed, it would be assumed that the site is eligible for listing on the register.

For purposes of analyzing impacts on archeological resources, thresholds of change for the intensity of an impact are based on the potential of the site to yield information important to prehistory or history, as well as the probable historic context of the affected site. The historic context of the site is based on the presence or absence of significant ties to a living community's cultural identity. For example, an archeological site located at the Hensley Settlement would be expected to have significant ties to the community's cultural identity through a Living Community Group. This would represent a significant tie to a living community's cultural identity. Thresholds used to evaluate effects on archeological resources are defined in Table 26, below.

**Table 26. Impact Thresholds for
Archeological Resources Eligible for/Listed on the National Register of
Historic Places**

Negligible effect: Impact is at the lowest levels of detection – barely measurable, with no perceptible consequences, either adverse or beneficial, to archeological resources. For purposes of Section 106, the determination of effect would be <i>no historic properties affected</i> .
Minor adverse effect: The action would affect one or more archeological sites with modest data potential and no significant ties to a living community's cultural identity. The site disturbance would result in little, if any, loss of important information potential. For purposes of Section 106, the determination of effect would be <i>no adverse effect</i> .
Minor beneficial effect: The action would result in preservation of a site in its natural state. For purposes of Section 106, the determination of effect would be <i>no adverse effect</i> .
Moderate adverse effect: The action would affect one or more archeological sites with good data potential and possible ties to a living community's cultural identity. Site disturbance would be noticeable. For purposes of Section 106, the determination of effect would be an <i>adverse effect</i> .
Moderate beneficial effect: The alternative would noticeably enhance the protection or preservation of one or more archeological sites that are listed or are eligible for the National Register. For purposes of Section 106, the determination of effect would be <i>no adverse effect</i> .
Major adverse effect: The action would impact one or more archeological sites or districts listed in, or eligible for the National Register and/or that has possible ties to a living community's cultural identity, resulting in loss of site or district integrity. Site disturbance or resource degradation would be highly visible. For purposes of Section 106, the determination of effect would be an <i>adverse effect</i> .
Major beneficial effect: The alternative would substantially enhance the ability to protect and interpret important archeological resources and would foster conditions under which archeological resources and modern society can exist in productive harmony and fulfill the social, economic, and other requirements of present and future generations. For purposes of Section 106, the determination of effect would be <i>no adverse effect</i> .
Duration: Long-term: Effects last more than 1 year. Short-term: Effects last less than 1 year.

Restoration of Cumberland Gap through major changes in the park's physical setting was designed to provide visitors with a better vision and understanding of the historic nature of the Gap and the Wilderness Road. However, existing management programs and zoning predate these physical changes in the landscape, lack the benefits of updated desired conditions, and do not include the enhanced potential for visitor understanding and appreciation afforded by restoration. The kinds and locations of visitor activities, facilities, and management actions appropriate for the park previous to restoration of the Gap, may not be equally beneficial post-restoration. Under Alternative A, continuation of existing park management programs and staffing related to cultural resources would not adequately or accurately reflect these major physical changes or related resource needs.

Management of the park's archeological resources is complicated by the fact that many areas lack intensive surveys. As discussed in the "Affected Environment" section, there is the possibility that there are unknown prehistoric and historic archeological resources within the boundaries of the park and in the Fern Lake area. Unknown, undocumented sites cannot be protected, and such sites could suffer adverse effects from unwitting visitor or management actions. Upon acquisition of Fern Lake and its watershed, cultural resource investigations would be initiated to identify, document, and evaluate the National Register significance of area resources. Planning for any new facilities would draw upon the survey and investigation findings to help avoid damage to archeological resources.

Although no ground-disturbing construction activity other than the construction of a composting comfort station at Fern Lake are proposed, any ground-disturbing activities associated with the Alternative A would have the potential to adversely affect such sites. Until inventory of un-surveyed areas of the park occurs, there could be some potential for inadvertent damage to unknown sites, resulting in adverse effects to these resources. Fern Lake is likely to have been historically used. Visitor use and development here could impact remnants of occupation or resource uses. Here and elsewhere in the park, development, maintenance, or improvement of facilities would be preceded by appropriate archeological investigations in compliance with Sections 106 and 110 of the National Historic Preservation Act, 36 Code of Federal Regulations 800, NPS Management Policies, and NPS Directors Order #28.

None of the known sites have been evaluated individually for National Register status, although a number are considered contributing elements to the Gap and Hensley historic districts. Without an evaluation of National Register significance and the integrity of recorded or known sites, it is difficult to develop appropriate, proactive management actions. Consequently, un-evaluated sites might not be adequately protected. Thus, lack of information could have an adverse effect on archeological resources.

Many of the park's known archeological resources are associated with the early history of the settlement and development of the area or with Civil War activities, and are located in areas receiving frequent visitor use. Thus, archeological sites may be vulnerable to unauthorized collecting, trampling, or displacement by erosion.

Archeological sites are vulnerable to natural processes as well as human actions. Bioturbation from insects and rodents can loosen structural features and disrupt soil stratigraphy. By mixing older and newer deposits, definition of different site occupants, functions, or periods of use are made more difficult. Vegetation growing in foundations or through and over structural ruins would continue to contribute to localized site degradation by expanding cracks and displacing structural elements. In the future, the integrity of some sites would continue to be degraded by natural processes such as wind and water erosion and vegetation encroachment, or by vandalism or inadvertent damage by visitors.

Archeological sites also would benefit under Alternative A. NPS management policies and programs would continue to provide an umbrella of protection for known sites by establishing proactive procedures for site identification, evaluation, management, preservation, and interpretation. On-going

park programs and visitor education, ranger patrols, and site avoidance during future ground disturbing activities in the park, would help slow the negative trend of site deterioration and the loss of information described above. Sites within the park would be less vulnerable to development activity than in surrounding areas. The park's numerous interpretive, outreach, and educational programs, and its partnering with local and regional organizations would continue as funding allows; these programs would help encourage visitor stewardship of archeological resources. Programs that educate visitors about the importance of cultural resources would help to discourage looting and inappropriate uses.

Under Alternative A, the size of the park and the complexity of its resources, combined with the lack of updated management zoning and desired future conditions, and with staffing and funding constraints, would contribute to future adverse effects on some archeological resources. Under Alternative A, the potential, therefore, exists for **long-term, minor to moderate, adverse effects** on archeological resources in more frequently visited areas.

NPS resource management strategies would continue to have **long-term, minor to moderate benefits** for the park's non-renewable resources threatened by natural processes or inappropriate visitor use.

Cumulative Effects

The time period included in this cumulative analysis stretches from the 1700s to the present; the area considered includes the park and the immediately adjacent areas. Archeological resources in the park are part of a larger cultural continuum that includes adjacent communities as well. Because of their age and non-renewable nature, archeological sites are especially vulnerable to deterioration and loss. In the past, human activities such as construction of regional and local transportation corridors, housing, recreational, and industrial facilities, both inside and outside the park have combined with natural processes such as wind, water, gravity, and bioturbation by insects and rodents to modify, add to, or destroy cultural sites, both within and adjacent to the park. Damming of the Little Yellow Creek to create Fern Lake in the 1880s, and more recently, creation and development of the park as well as other regional developments such as Whitmer Industrial Park and Bell County Technology and Training Park, may have buried or destroyed some prehistoric and protohistoric sites. These present resource losses across this broad geographic area have reduced the integrity and the numbers and types of sites available for research and interpretation, leaving a somewhat skewed vision of past cultures for the future generations. Similar human activities and natural processes are expected to continue into the future, contributing to **long-term, moderate and adverse, cumulative effects** on archeological resources.

Over the years, NPS management policies and programs have provided an umbrella of protection for cultural sites by establishing proactive procedures for their identification, evaluation, management, and interpretation. The park's resource management plans and various special studies have provided the best possible care for non-renewable resources. Future resource stewardship strategies would contribute to the care and management of the valuable resources. These actions have had a **long-term beneficial effect** on archeological resources.

When the moderate adverse effects of other past, present, and future plans, projects, and activities affecting archeological resources in the park and surrounding areas are combined with the **minor to moderate, beneficial and adverse impacts** in Alternative A, the resulting cumulative effects would be **long-term, moderate, and adverse**. Effects would be **moderate and adverse** because the numbers and extent of sites affected in areas surrounding the park far outweigh the benefits of park programs on resources within park boundaries.

Conclusions

Under Alternative A, there would be **long-term, minor to moderate, adverse effects** on archeological resources in selected areas, including Fern Lake, primarily due to lack of updated management zoning and visitor use. **Long-term, minor to moderate benefits** would accrue from continuing NPS management actions and protection of sites within the park. Cumulative effects would be **long-term, moderate and adverse** (adverse effects on regional sites outweigh benefits from park programs on sites within park boundaries).

There would be no impairment of archeological resources or values as a result of park actions under Alternative A.

Impacts of Alternative B on Archeological Resources

As compared to Alternative A, Alternative B would provide for larger and more numerous Developed Zones, greater potential for new facilities, and increased visitor access. In addition, construction of seven new minor facilities in Developed Zones at the Hensley Settlement, Fern Lake and the Wilderness Road Campground would be constructed, and would have a potential to affect archeological resources (see Chapter 2 for detailed information on these projects).

Under Alternative B, management zones for the park (including a Cultural Resource Zone) would be established to define the types of visitor experience, resource condition, activities, and facilities that are appropriate for each zone. Two historic areas would be included within the Cultural Resource Zones: the Hensley Settlement and Cumberland Gap. These Cultural Resource Zones would include slightly more acreage (608 acres) as compared to the existing historical zones with 573 acres. Alternative B proposes a high level of resource and visitor management so as to protect resources in the Cultural Resource Zone, with a low tolerance for resource degradation.

The number of visitors at the Hensley Settlement would be expected to increase due to the availability of a limited number of new facilities. Under Alternative B, increased pedestrian traffic could, therefore, result in loss of ground cover and erosion of pathways and areas around historic structures. Erosion has been previously documented around the historic structures at the settlement. Erosion results in loss of archeological deposits and the displacement and deterioration of artifacts. Also, there are aboveground features such as collapsed chimneys and foundations that are vulnerable to climbing and displacement of stones. Continuing park maintenance would help to rehabilitate unauthorized trails and to limit erosion, however.

Under Alternative B, the Cultural Resource Zone and Developed Zone to the west would be enlarged. Additional and upgraded access routes and an enlarged parking area at the Hensley Settlement would involve ground disturbance. Because much of this ground disturbance would occur in the vicinity of a historic site, the potential for encountering subsurface archeological resources would be heightened. Prior to development of the final design, archeological investigations, as described in Table 9 of Chapter 2, would be initiated to identify the potential presence, location, and significance of archeological resources, and to help define areas where new parking and access facilities would have the least possible effect on archeological sites.

These new facilities could have an adverse effect on any archeological resources present; once an archeological site has been disturbed, it cannot be restored. However, formal archeological investigations conducted as part of a planned mitigation or research program can reveal a great deal of additional information about the history of the area, about the people who lived here, and about their lifestyles. This information would be a valuable addition to the park's interpretive programs. Such interpretative programs would be important in developing a sense of resource stewardship among visitors. However, despite the educational and scientific research benefits, excavation of archeological

remains is almost always considered an adverse effect as defined by Section 106 of the National Historic Preservation Act.

Under Alternative B, the historic Cumberland Gap area would also be designated as a Cultural Resource Zone. This zone would be the same size as the historical zone designated at the Gap due to the differences in planning methods and mapping techniques. There are a number of sites in the Gap area where artifacts are present on the surface. Some sites, such as Hensley, contain exposed features. In addition, archeological investigations associated with restoration of the Gap, as well as the extensive ground modification, would reduce the potential for the presence of artifacts or features. As appropriate, additional archeological investigations (as described above) would be conducted to help ensure that the new Developed Zone, trail connections, and trail extensions do not harm significant archeological resources.

Alternative B also proposes some construction of new facilities and increased access to other areas of the park outside of the two Cultural Resource Zones. As described above, development of parking, new structures, and trails at Fern Lake and elsewhere could have adverse effects on archeological resources by damaging features and mixing soil strata. Appropriate archeological investigations would be designed to reduce the potential for encountering significant subsurface resources in Developed Zones.

Increased access would increase the potential for opportunistic damage to archeological resources to occur, due to trampling, erosion, unauthorized collecting, and vandalism. Improved access would likely cause an increase in the numbers of visitors in these areas; the presence of other visitors is often a powerful deterrent to unlawful behavior. New facilities would be provided to maximize resource protection. The creation of properly designed trails would benefit archeological resources by reducing creation and use of unauthorized trails that can result in increased erosion and displacement of near-surface/surface artifacts.

Adverse effects from natural processes would be the same as described in Alternative A.

Under Alternative B, there would be **long-term, negligible to minor, adverse** effects on archeological resources and **minor to moderate benefits** for park management of these resources. If significant resources were located in the Hensley Settlement areas proposed for project construction, archeological investigations, preparation of an environmental assessment, and other mitigating measures would reduce the impact intensity. Adverse effects of development would also be reduced by mitigation measures described under “Best Management Practices” and by management strategies. Newly defined, desired future conditions and zoning would join with on-going partnering, outreach, and educational programs to result in **long-term, minor to moderate benefits** to archeological resources.

Cumulative Effects

Under Alternative B, the time period, area of effect, and cumulative effects of archeological resources would be much the same as described in Alternative A (e.g., effects on resources in areas surrounding the park would be the same as described in Alternative A). The potential for adverse effects from development actions at Fern Lake and Hensley Settlement, and from creation of new access routes/connections, would be slightly more increased than in Alternative A, but when protective and mitigating measures of Alternative B are added, the overall cumulative effect would not be appreciably changed.

Thus, when the moderate adverse effects of other past, present, and future plans, projects, and activities affecting archeological resources in the park and surrounding areas are combined with the **minor to moderate, beneficial, and negligible to minor, adverse** impacts under Alternative B, the

resulting cumulative effects would be **long-term, moderate, and adverse**. Effects would be moderate and adverse because the numbers and extent of sites affected in areas surrounding the park far outweigh the benefits of park programs for resources within park boundaries.

Conclusions

Under Alternative B, there would be **long-term, negligible to minor, adverse effects** on archeological resources from development of new access routes, parking, visitor use, and natural processes. Mitigating measures would help reduce the potential for effects from development proposed in the vicinity of the Hensley Settlement.

The management strategies and zoning accompanied by the newly defined desired future conditions, along with partnering, outreach and educational programs would have **long-term, minor to moderate benefits** on archeological resources. Cumulative effects would be **long-term, moderate, and adverse**, largely due to the numbers and extent of archeological resources affected in areas surrounding the park.

There would be no impairment of archeological resources under Alternative B.

Impacts of Alternative C on Archeological Resources

Compared to Alternative A, Alternative C would provide for larger and more numerous developed zones, greater potential for new facilities, and increased visitor access. This would increase the potential for adversely affecting archeological resources. In addition, 11 new minor facilities in the Developed Zones at the Hensley Settlement, the base of Brush Mountain, Fern Lake, and the Wilderness Road Campground would be constructed. These would potentially affect archeological resources (see Chapter 2 for detailed information on these projects).

Similar to Alternative B, few *in situ* artifacts or archeological features would be expected at a number of these sites (such as park headquarters and visitor center) due to previous archeological investigations and ground disturbance during construction and Gap restoration. However, other proposals would be preceded by archeological studies and possible discovery of archeological resources. With appropriate compliance actions, testing, and avoidance, as described in Alternative B, archeological resources would have **long-term, minor, adverse effects** under Alternative C. Costs for the amount of archeological work needed for implementation of Alternative C would, however, be higher compared to Alternative A.

Creation of many new ways for visitors to access various parts of the park would open some areas that presently receive small amounts of visitors, to additional hiking, climbing, caving, horseback riding, and other activities. This would increase the likelihood of visitors encountering undocumented and unprotected archeological resources. As described in Alternative B, the presence of other visitors is an excellent deterrent to inappropriate treatment of archeological resources, but some resource damage could still occur.

Proposed increased levels of staffing, education (including stewardship language in exhibits and signage), outreach, and partnering would help reduce some of the potential damage to archeological resources. Increased numbers of park staff would be proposed to patrol and provide resource protection for the enlarged number of visitor access routes and destinations where archeological resources could suffer adverse effects from looting, vandalism, or damage from horse trails.

Friends, groups, and students could serve as resource “guardians” to monitor resource conditions and to report on-going resource threats. Visitor education would help build stewardship for archeological resources, and partnering would provide needed archeological surveys and protective measures.

Increased educational, interpretive, outreach and management efforts under Alternative C would have **long-term, moderate, beneficial effects** on archeological resources.

All these approaches would help avoid most of the potential adverse effects due to additional access and visitor use. Implementation of Alternative C would have both **long-term, moderate benefits and long-term, minor, adverse effects** on archeological resources.

Cumulative Impacts

Under Alternative C, the time period, affected area, and the loss of archeological resources in areas surrounding the park, would be the same as described in Alternative A. The potential for adverse effects from development actions, creation of new access routes/connections, and increased visitor use within the park, would be slightly greater than in Alternative A. Protective and avoidance measures included in Alternative C would help reduce the potential for adverse effects.

When the moderate adverse effects of other past, present, and future plans, projects and activities affecting archeological resources in the park and surrounding areas are combined with the moderate beneficial and minor adverse impacts under Alternative C, the resulting cumulative effects would be **long-term, moderate and adverse**. Effects would be moderate and adverse because the numbers and extent of sites affected regionally would tend to outweigh the benefits of park programs for resources within park boundaries.

Conclusions

Under Alternative C, educational, interpretive, outreach and management efforts would confer **long-term, moderate, beneficial effects** while effects of increased access and visitor use would result in **long-term, minor, adverse effects** on selected archeological resources. Cumulative effects would be **long-term, moderate, and adverse**. Effects would be moderate and adverse because the numbers and extent of sites affected regionally would outweigh the benefits of park programs on resources within park boundaries.

There would be no impairment of archeological resources under Alternative C.

Impacts of Alternative A on Cultural Landscapes, Including Historic Buildings, Structures, and Districts

Laws and regulations applicable to cultural landscapes, historic buildings, structures, and districts are described in the preceding section, as is the area of potential effect and the method used to analyze potential impacts.

The method for assessing impacts on cultural landscapes, including historic buildings, structures, and districts is presented in the section entitled “Method”, within the “Cultural Resources” section. For typical mitigation measures see Table 9 in Chapter 2.

Historic buildings, structures, and districts are vital components of the park’s landscapes. For this reason, the following discussion will combine cultural landscapes with historic structures, buildings, and districts. Thresholds for this impact topic are presented in Table 27 below.

Table 27. Impact Thresholds for Cultural Landscapes, Historic Buildings, Structures and Districts Listed in or Eligible for the National Register of Historic Places

Negligible effect: The activity potentially would not cause effects to cultural landscapes, historic buildings, or districts that would alter any of the characteristics that would qualify the resource for inclusion in, or eligibility for, the National Register. For purposes of Section 106, the determination would be <i>no historic properties affected</i> .
Minor adverse effect: The action would affect one or more features of a structure, building, district, or landscape, but it would neither alter its character-defining features, nor diminish the overall integrity of the property that qualify it for inclusion in, or eligibility for, the National Register. For purposes of Section 106, the determination of effect would be <i>no adverse effect</i> .
Minor beneficial effect: The action would maintain and improve the character-defining features of the structure, building, or district in accordance with <i>The Secretary of the Interior's Standards for the Treatment of Historic Properties</i> (NPS 2005). For purposes of Section 106, the determination would be <i>no adverse effect</i> .
Moderate adverse effect: The action would alter one or more character-defining features of the structure, building, district, or landscape. While the overall integrity of the resource would be diminished, the property would retain its National Register eligibility. For purposes of Section 106, the determination would be an <i>adverse effect</i> .
Moderate beneficial effect: Positive actions would be taken to preserve and noticeably enhance character-defining elements of a structure, building, or district in accordance with <i>The Secretary of the Interior's Standards for the Treatment of Historic Properties</i> (NPS 2005). For purposes of Section 106, the determination would be <i>no adverse effect</i> .
Major adverse effect: The action would alter character-defining features of a structure, building, district, or landscape, seriously diminishing the overall integrity of the resource to the point where its National Register eligibility may be questioned. For purposes of Section 106, the determination would be an <i>adverse effect</i> .
Major beneficial effect: The action would enhance the character-defining features of a structure, building, or district that represents important components of the nation's historic heritage and would foster conditions under which these cultural foundations of the nation and modern society could exist in productive harmony and fulfill the social, economic, and other requirements of present and future generations. For purposes of Section 106, the determination of effect would be <i>no adverse effect</i> .
Duration: Long-term: Effects last more than 1 year. Short-term: Effects last less than 1 year.

The park's two historic districts (Cumberland Gap and the Hensley Settlement) can also be considered potential cultural landscapes. Other areas in the park also contain elements of cultural landscapes reflecting the Civil War, industrial development, and early settlement. Continuation of current management practices, directions, and trends at Cumberland Gap National Historical Park would have very few new impacts on cultural landscapes, buildings, structures, or districts. Throughout the park, emphasis would be on continuing restoration and preservation of the cultural (historic) landscape. However, it is unclear how much congruity there is between the old (1979) historic zones and the newly restored Gap area, or whether the cultural landscapes adequately encompass and fully express the importance of the restored areas in the park.

Historic structures and buildings within the two historic districts (Hensley Settlement and Cumberland Gap) would continue to be maintained in a manner that preserves their integrity and National Register eligibility. However, lack of funding and staff could make it difficult to keep up with

structural and landscaping needs. Visitors would continue to have limited access, the ability to view historic structures, and the ability to enjoy interpretive programs on a seasonal basis.

Continuation of the various interpretive, outreach, education, and partnering programs currently underway, would aid in providing education and understanding of the park's historic resources, resulting in added appreciation and a sense of stewardship (a **long- and short- term, minor to moderate benefit**). A **long-term, negligible to minor, adverse effect** on the park's cultural landscapes, buildings, structures, and districts would result from lack of funding and staffing.

Cumulative Impacts

The time period included in this cumulative analysis extends from the early 1700s to the present; the area considered includes the park and immediately adjacent areas. The landscape in and near the park has changed dramatically over the past three centuries. Major changes in transportation systems have seen super highways replace traces and trails; the sounds of diesel trucks echo through the forested mountains. Modern towns and industrial plazas such as Whitmer Industrial Park and Bell County Technology and Training Park have replaced isolated cabins and crude settlements. Restoration of the Gap helped return part of the area to the way it appeared in earlier times, but much of the rest of the landscape has lost much of its integrity; these losses are expected to continue into the future.

Loss of the integrity of landscape features over time constitutes a **long-term, moderate, adverse effect** on the historical landscape surrounding the park and on some developed areas of the park itself.

When the moderate adverse effects of other past, present, and future plans, projects, and activities affecting cultural landscapes, historic structures, buildings, and districts in the park and surrounding areas are combined with the moderate benefits of Alternative A, the resulting cumulative effects would be **long-term, moderate and adverse**. Effects would be moderate and adverse because the overall extent of the changed regional landscape would tend to outweigh the benefits of the landscapes preserved within the park.

Conclusions

Continuation of the various interpretive, outreach, education, and partnering programs currently underway would aid in providing education and understanding of the park's historic resources, resulting in added appreciation and a sense of stewardship (a **long- and short-term, minor to moderate benefit**). A **long-term, negligible to minor, adverse effect** on the park's cultural landscapes, buildings, structures, and districts would result from lack of funding and staffing. Cumulative effects would be **long-term, moderate, and adverse** because the overall extent of the changed regional landscape would tend to outweigh the benefits of buildings, structures, districts, and landscapes preserved within park boundaries.

There would be no impairment of cultural landscapes, historic buildings, structures and districts under Alternative A.

Impacts of Alternative B on Cultural Landscapes, Historic Buildings, Structures, and Districts

Under Alternative B, opportunities for visitor use and access to the park would be increased by the creation of larger Developed Zones, greater potential for new facilities, and increased visitor access by routes connecting different Developed Zones. New or enlarged Developed Zones in Alternative B would total more than twice the area occupied by development in Alternative A. A number of these provisions would have the potential to adversely affect cultural landscapes, so additional efforts to manage cultural and natural resources would be required to maintain resource condition and character. In addition, construction of seven new minor facilities in Developed Zones at the Hensley

Settlement, Fern Lake, and the Wilderness Road Campground would be constructed. These would potentially affect cultural landscapes, historic building, etc. (see Chapter 2 for detailed information on these projects). This would constitute a **long-and short term, minor adverse effect**.

Implementation of Alternative B would have both adverse and beneficial effects on cultural landscapes, historic buildings, structures, and districts. The 35-acre increase in the size of the new Cultural Resource Zone at Hensley Settlement (when compared with the current historic zone under Alternative A) would be beneficial since it helps to maintain the surrounding landscape integrity. At Cumberland Gap the designated Cultural Resource Zone would be slightly smaller than the current historic zone, and this would have a negligible effect on the historic scene in this area.

Addition of new visitor facilities at the Hensley Settlement could have an adverse effect on this cultural landscape, so special care would be taken regarding development activity here to ensure compatibility with the historic scene. To reduce the impact of development on the adjacent Hensley landscape, the number and type of new facilities would be limited and would be built in the context of the historic district. New structures would be non-intrusive and would be compatible with the historic structures in their design, scale, massing, workmanship, association, and materials. Historic structures in the historic districts would be maintained to protect their historic features, materials, and integrity.

There would be **short-term, adverse effects** of a minor nature on the vegetation during the construction phases at the Hensley Settlement and at Cumberland Gap. Vegetation chosen for replanting would accurately replicate the trees and other plants present during the period of significance regarding the historic district/cultural landscape.

New facilities at the Gap and at the Hensley Settlement would encourage additional visitation, which could result in overcrowding and congestion that would detract from the historic feeling of the area, and contribute to overuse and deterioration of historic structures. Congestion in the historic districts might be reduced by such measures as staggering the times for guided tours, but congestion could still have a **minor, adverse effect** on the character of the area.

On a park-wide basis, addition of facilities such as trails, roads, and parking would increase opportunities for visitor access and use of the park and would tend to spread out visitation. While these additions and changes could potentially intrude adversely on the park's cultural landscapes, they could also help to reduce congestion at the Gap and the Hensley Settlement by offering visitors alternative choices.

Historic resources would be managed to maintain their resource condition and character. All stabilization/preservation of historic features/structures/landscapes would be conducted in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties and character, in accordance with relevant Cultural Landscape Report(s) and Historic Structure Report(s). Studies to identify historic properties and assess effects would be carried out in advance of undertakings and would comply with the requirements of Sections 106 and 110 of the NHPA, 36 Code of Federal Regulations 60, 36 Code of Federal Regulations 800, and NPS Director's Order 28.

To reduce the potential adverse effects of development outside of the historic districts, new facilities would be designed to merge gently into the surrounding landscape. Vegetation would suffer **short-term, adverse effects** following construction phases, but replacement plantings would reflect the historic nature of the park. New facilities at Fern Lake, the Visitor Center area, and the Wilderness Road Campground would be designed to be unobtrusive and compatible with the historic developments in the park as described above for the Hensley Settlement. Biking and hiking trails to connect the Wilderness Road Campground to the Wilderness Road and the Gap, would be included in the Developed Zone. These trails and expansion of the Developed Zone to include Pinnacle Road and Kentucky State Highway 988 from Sugar Run to the Gap area, improvement of Shillalah Creek Road,

and creation of a new parking area at the base of Brush Mountain, would all be constructed in a manner that would not detract from the cultural landscape or natural scenery and would be compatible with the park's historic districts.

Under Alternative B, the levels and affects of public outreach, education, and partnering would be the same as in Alternative A. Continuation of these management strategies would have **long-term, minor to moderate benefits** on cultural resources. Adverse effects of Alternative B on cultural landscapes, buildings, structures, and districts would be **long-term and minor**.

Cumulative Impacts

The time period included in this cumulative analysis extends from the early 1700s to the present; the area considered includes the park and immediately adjacent areas. Cumulative effects for Alternative B would be the same as discussed in Alternative A, **long-term, moderate and adverse**.

Development adjacent to the Hensley Settlement would add a modest amount of modern parking and other facilities adjacent to the historic landscape. There would be additional changes in the park-wide cultural landscape due to the expansion of Developed Zones at the visitor center, Sugar Run, Wilderness Road Campground, Fern Lake, and other areas. However, these changes affect a small portion of the park (Figures 6 and 7; Table 6), and the contribution to cumulative effects would be minor.

When the moderate adverse effects of other past, present, and future plans, projects, and activities affecting cultural landscapes, historic structures, buildings, and districts in the park and surrounding areas are combined with the **long-and short-term, minor to moderate benefits and minor, adverse effects** of Alternative B, the resulting cumulative effects would be **long-term, moderate and adverse**. Effects would be moderate and adverse because the overall extent of the changed area's landscape would continue to outweigh the landscapes preserved within park boundaries.

Conclusions

With measures outlined in Alternative B to reduce overcrowding and congestion, and with adherence to careful design and attention to scale, workmanship, massing, association, and materials, the effects of development of new park facilities on cultural landscapes, historic structures, buildings and districts at Hensley Settlement and the Gap and on other park landscapes would be **long- and short-term, adverse, and minor**. Landscape vegetation would suffer **short-term, minor adverse effects** following facility improvements. Continuing management strategies would have **long-term, minor to moderate benefits** on cultural resources. Cumulative effects would be **long-term and moderately adverse** because the adverse effects of past and on-going development regionally would continue to outweigh the benefits conferred by park protection of landscapes, structures, buildings and districts.

There would be no impairment of cultural landscapes, historic buildings, structures, and districts in Alternative B.

Impacts of Alternative C on Cultural Landscapes, Historic Buildings, Structures, and Districts

Under Alternative C, opportunities for visitor use and access would be increased by the creation of larger and more numerous Developed Zones, greater potential for new facilities, and increased visitor access routes connecting different Developed Zones. A number of these provisions would have the potential to adversely affect cultural landscapes, so additional efforts to manage cultural and natural resources would be required to maintain resource condition and character.

Installation of new facilities such as a rustic rain shelter and a composting comfort station at the Developed Zone to the Hensley Settlement would be done in a manner that would not intrude on the

cultural landscape. Close attention would be paid to the design, materials, scale, workmanship, association, and massing of these new structures. Continuing maintenance of historic structures and buildings would help ensure protection of the park's historic districts and landscapes.

Historic resources would be managed to maintain their resource condition and character. All stabilization/preservation of historic features/structures/landscapes would be conducted in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties and character, in accordance with relevant Cultural Landscape Report(s) and Historic Structure Report(s). Studies to identify historic properties and assess effects would be carried out in advance of undertakings and would comply with the requirements of Sections 106 and 110 of the NHPA, 36 Code of Federal Regulations 60, 36 Code of Federal Regulations 800, and NPS Director's Order 28.

New facilities and improvements in the Developed Zone at Fern Lake would use the appropriate design principles to ensure that facilities, construction, operation, and use are compatible with existing structures, with other park facilities, and with the historic nature of the park.

Outside of the Hensley Settlement and the Gap, some potentially adverse effect on the overall park landscape would be minimized by close attention to the location and the way that facilities are laid out on the land, and by using vegetation and the configuration and contours of the natural land forms to blend new trails, roads, parking, and other facilities imperceptibly into the landscape. Resource identification and evaluation would precede actions that could adversely affect the landscape in Alternative C, and an environmental assessment and a Cultural Landscape Report would be completed to evaluate individual impacts of actions prior to their implementation.

Increased and formalized public outreach, education, and partnering would help expand existing educational and outreach programs. Links with state and local parks would be increased, as would educational information available on the Internet. These measures would help develop public awareness of the irreplaceable nature of the park's cultural resources, and of the ways in which visitors could contribute to the preservation of the cultural landscape. These various measures would have **long-term, moderate benefits** for cultural landscapes, structures, buildings and districts. **Long-term, minor, adverse effects** would result from new facilities, construction, operation, and use within the historic districts.

Cumulative Impacts

The time period included in this cumulative analysis extends from the early 1700s to the present; the area considered includes the park and immediately adjacent areas. Cumulative effects for Alternative C in the surrounding region would be the same as discussed in Alternative A (**long-term, moderate and adverse**).

Alternative C proposes expansion of a number of existing Developed Zones and the addition of new areas to provide visitors with more opportunities to see and learn about the park. As described for Alternative B, measures such as use of sensitive design principles would mitigate most of the potentially adverse effects of Alternative C on the Gap and the Hensley Settlement cultural landscapes. Expansion of some Developed Zones, while using those same design principles, could help mitigate the addition of new trails, roads, and added facilities in this area. The size, configuration, and geomorphology of the park would also allow such additions and changes to the landscape to occur without an apparent visual intrusion by the new facilities. However, each new facility, new road, or new trail results, in a seemingly imperceptible manner, in a modification of the landscape. Over time, these landscape changes combine to produce a cumulative effect on the park landscape.

When the moderate adverse effects of other past, present, and future plans, projects and activities affecting cultural landscapes, historic structures, buildings, and districts in the park and surrounding

areas are combined with the **long- and short-term, minor to moderate benefits and minor, adverse effects** of Alternative C, the resulting cumulative effects would be **long-term, moderate and adverse**. Effects would be moderate and adverse because the overall extent of the changed area landscape would continue to outweigh the landscapes preserved within the park boundaries.

Conclusions

Under Alternative C, increased and formalized public outreach, education, and partnering, links with state and local parks, and educational uses of the Internet would contribute to the preservation of the cultural landscape and its buildings, structures, and districts, providing a **long-term, moderate benefit**. With mitigation (including resource identification, evaluation, and protection) new facilities, construction, operation, and use would have a **long-term, minor, adverse effect** on the landscape, structures, buildings, and districts.

Cumulative effects would be **long-term, moderate and adverse** because the overall extent of the changed area landscape and loss of historic structures and buildings regionally, would outweigh the landscapes, structures, buildings, and districts preserved within park boundaries.

There would be no impairment of cultural landscapes, historic buildings, structures and districts under Alternative C.

Impacts of Alternative A on Ethnographic Resources, Traditional Cultural Properties, and Values

Certain important questions about human culture and history can only be answered by gathering information about the cultural content and context of cultural resources. Questions about contemporary peoples or groups, their identity, and heritage have the potential to be addressed through ethnographic resources. Typically, the term “ethnographic resources” refers to resources valued by American Indians with long-term cultural ties to a particular geographic area. Area history closely links American Indians to this region where both prehistoric and historic Indian peoples followed migratory game through the park along what would come to be known as the Warrior’s Trail. This trail remains a visible reminder of that long-term historic association; legends and stories told by tribal elders recall connections to the park and surrounding area. However, consultation with concerned tribes has not identified any Traditional Cultural Properties, sacred sites, or specific tribal concerns related to Cumberland Gap National Historical Park.

Please refer to the previous section for a description of the methods applied in analysis of this topic. Thresholds for this impact topic are presented in Table 28.

Restoration of Cumberland Gap enables American Indians to better visualize the landscape as it existed in the early 1700s, and existing outreach and interpretive programs would continue to provide information about their traditional history in this area. For those descendants of the pioneers who lived in this area prior to its designation as a national park, the Hensley Settlement, and related interpretive and outreach programs, would continue to perpetuate and celebrate the historic ties these families have to the park. Continuation of existing conditions and perpetuation of solid relationships between park managers and descendants of prior inhabitants of the park would have **long-term, minor, beneficial** effects to ethnographic groups.

Table 28. Impact Thresholds for Ethnographic Resources (Including Traditional Cultural Properties and Values) Listed in or Eligible for the National Register of Historic Places

Negligible effect. The action potentially would not alter either resource conditions, such as traditional access or site preservation, or the relationship between the resource and the affiliated group's body of beliefs and practices. There would be no change to a group's body of beliefs and practices. For purposes of Section 106, the determination of effect on ethnographic resources would be <i>no effect on historic properties</i> .
Minor adverse effect. The action would have a slight but noticeable effect. It would not appreciably alter resource conditions, such as traditional access or site preservation, or the relationship between the resource and the affiliated group's body of beliefs and practices. For purposes of Section 106, the determination of effect on ethnographic resources would be <i>no adverse effect</i> .
Minor beneficial effect. The action would enhance traditional access and/or accommodate a group's traditional practices or beliefs. For purposes of Section 106, the determination of effect on ethnographic resources would be <i>no adverse effect</i> .
Moderate adverse effect. The effect of the action would be apparent and would alter resource conditions. Interference to traditional access, site preservation, or the relationship between the resource and the affiliated group's beliefs and practices would occur, even though the group's beliefs and practices would survive. For purposes of Section 106, the determination of effect on ethnographic resources would be an <i>adverse effect</i> .
Moderate beneficial effect. The action would facilitate a group's beliefs and practices. For purposes of Section 106, the determination of effect on ethnographic resources would be <i>no adverse effect</i> .
Major adverse effect. The effect of the action would alter resource conditions. Traditional access, site preservation, or the relationship between the resource and the affiliated group's body of beliefs and practices would be blocked or greatly affected, to the extent that the survival of a group's beliefs and/or practices would be jeopardized. For purposes of Section 106, the determination of effect on ethnographic resources would be an <i>adverse effect</i> .
Major beneficial effect. The action would encourage a group's beliefs or practices. For purposes of Section 106, the determination of effect on ethnographic resources would be <i>no adverse effect</i> .
Duration: Long-term: Effects last more than 1 year. Short-term: Effects last less than 1 year.

Cumulative Impacts

The time period included in this cumulative analysis stretches from the early 18th century to the present; the area considered includes the park and immediately adjacent areas. Over the years, changes in agricultural practices, settlement patterns, industry, and society in general have resulted in a highly mobile 21st century society. Over the past century in the region surrounding the park, development and industry have swept away numerous historic structures, changed land use patterns, and built new roadways. Many American Indians were moved to reservations far from their homeland and their traditional hunting grounds as Euro-Americans settled into the region. With each of these changes, associated cultural traditions have been lost.

Given these changes in American society, fewer and fewer families retain strong ties to the land or the traditional practices of their ancestors. As a result, many traces of earlier settlements and traditionally used places in the area surrounding Cumberland Gap have been lost or forgotten; it is a **long-term, moderate, adverse effect** on the region's ethnographic values. Yet, for many American Indians and descendents of area pioneers, Cumberland Gap remains a place that is remembered and cherished

through the generations. Interpretive and outreach programs and the restoration of the Gap help to retain these cultural traditions, values, and memories; this is a **long-term, moderate and beneficial effect**.

When the moderate adverse effects of other past, present, and future plans, projects, and activities affecting ethnographic resources in the park and surrounding areas are combined with the moderate beneficial effects under Alternative A, the resulting cumulative effects on ethnographic resources and traditional values would be **long-term, moderate and adverse**. Effects would be adverse because regional and national changes in traditional ways of life would be expected to continue into the future, further diminishing these cultural traditions.

Conclusion

Continuation of existing conditions would have **long-term, moderate benefits** for ethnographic groups through the preservation of cultural traditions and valued places in the park. Cumulative effects would be **long-term, moderate and adverse** because of the continuing loss of cultural traditions regionally and nationally.

Under Alternative A, there would be no impairment of ethnographic resources or traditional values.

Impacts of Alternative B on Ethnographic Resources, Traditional Cultural Properties, and Values

Under Alternative B, establishment of Cultural Resource Zones would have a **negligible effect** on American Indian ethnographic resources and values. Opportunities for Developed Zones and expansion of new visitor facilities in the park (roads, trails, etc.) would increase the potential for encountering archeological sites related to prehistoric and historic human use of this area. Presently, no traditional cultural sites have been formally defined in the park. Because some tribes may be uncomfortable with archeological investigations of sites that possibly could be related to their historic occupation of this area, construction and operation of park facilities could have a **negligible to minor, adverse effect** on ethnographic values. On the other hand, development of roads, trails, and other facilities would be a benefit to some tribal members who come here as visitors.

A similar scenario exists for the descendents of the area's early settlers. Some may feel that proposed development of roads, trails, and other visitor facilities would be inappropriate because the facilities could alter the landscape and change places on the land that they remember. But others would appreciate the preservation of and the access to the Hensley Settlement and interpretation of pioneer life at the park, understanding that the Hensley Settlement would continue to give their children and grandchildren a deeper awareness of the past that their ancestors created here. Perpetuation of existing solid relationships between park managers and descendents of prior inhabitants of the park would have **long-term, beneficial** effects to ethnographic groups.

Continuation of the various interpretive, outreach, education, and partnering programs currently underway would aid in providing education and understanding of the park's ethnographic resources. Under Alternative B, there would be **long-term, minor, adverse and moderate, beneficial effects** on ethnographic resources.

Cumulative Effects

The time period included in this cumulative analysis stretches from the early 18th century to the present; the area considered includes the park and immediately adjacent areas. Cumulative effects for the area surrounding the park would be the same as described for Alternative A. Within the park, there could be modest changes in remembered places, but park programs and outreach, combined with

continued preservation of the Hensley Settlement would help to retain cultural traditions, values, and memories; this would be a **long-term and moderate, beneficial effect**.

When the moderate, adverse effects of other past, present, and future plans, projects and activities affecting ethnographic resources in the park and surrounding areas are combined with the moderate beneficial effects under Alternative B, the resulting cumulative effects on ethnographic resources and traditional values would be **long-term, moderate and adverse**. Effects would be adverse because regional and national changes in traditional ways of life would be expected to continue into the future, further diminishing local cultural traditions.

Conclusions

Under Alternative B, there could be **long-term, minor, adverse effects** on ethnographic resources due to new facility construction, operation, and use, but **long-term, moderate beneficial effects** on ethnographic resources would also result in providing better access to remembered and valued places and by continuing interpretation of traditional cultural resources and practices.

Cumulative effects on ethnographic resources and traditional values would be **long-term, moderate and adverse**. Effects would be adverse because regional and national changes in traditional ways of life would be expected to continue into the future, further diminishing local cultural traditions.

Under Alternative B, there would be no impairment of ethnographic resources or traditional values.

Impacts of Alternative C on Ethnographic Resources, Traditional Cultural Properties, and Values

Under Alternative C, negligible effects on American Indian ethnographic resources and values would result from the establishment of Cultural Resource Zones (at present, no traditional cultural places have been defined within the park). Expansion of new visitor facilities such as roads, trails, and Developed Zones in the park would increase the potential for encountering archeological sites valued by tribes, which would result in a **minor, adverse effect** on ethnographic values. Development of roads, trails, and other visitor facilities would be considered beneficial by some tribal members who come here as visitors. Perpetuation of existing solid relationships between park managers and descendents of prior inhabitants of the park would have **long-term, beneficial effects** to ethnographic groups.

Increases in new facility construction, operation, and use could have both benefits and adverse effects on ethnographic values held by descendents of the area's early settlers. Minor adverse effects could result from the proposed development of new visitor facilities that could change the appearance of the landscape or familiar places. Preservation and continuing interpretation of the Hensley Settlement and interpretation of pioneer life here would continue to give traditional groups and their children an understanding of the pioneer life of their ancestors; this is a **long-term, moderate, and beneficial effect**.

Expansion of the various interpretive, outreach, education, and partnering programs currently underway would aid in providing education and understanding of the park's ethnographic resources. Under Alternative C, there would be **long-term, minor, adverse and moderate beneficial effects** on ethnographic resources.

Cumulative Effects

The time period included in the cumulative analysis, the area considered, and the adverse or beneficial effects on ethnographic resources and values would be the same as described for Alternative B (**long-term, moderate and beneficial**). However, because of the slightly increased potential for new facility

construction, operation, and use under Alternative C, there could be a few changes in remembered places for both tribes and descendants of area pioneers; a minor adverse effect. Park programs and outreach, combined with continued preservation of the Hensley Settlement, would help to retain cultural traditions, values, and memories, a **long-term, moderate benefit**.

When the moderate adverse effects of other past, present, and future plans, projects and activities affecting ethnographic resources in the park and surrounding areas are combined with the moderate beneficial effects and minor adverse effects under Alternative C, the resulting cumulative effects on ethnographic resources and traditional values would be **long-term, moderate and adverse**. Effects would be adverse because regional changes in traditional ways of life would be expected to continue into the future, further diminishing these cultural traditions.

Conclusions

Expansion of the various interpretive, outreach, education, and partnering programs currently underway would aid in providing education and understanding of the park's ethnographic resources. Under Alternative C, there would be **long-term, minor, adverse and moderate beneficial effects** on ethnographic resources.

When the moderate adverse effects of other past, present, and future plans, projects and activities affecting ethnographic resources in the park and surrounding areas are combined with the moderate beneficial effects and minor adverse effects under Alternative C, the resulting cumulative effects on ethnographic resources and traditional values would be **long-term, moderate and adverse**.

Under Alternative C, there would be no impairment of ethnographic resources or traditional values.

SECTION 106 ASSESSMENT

Two action alternatives (B and C) and the No Action Alternative—Alternative A are contained in this draft general management plan/environmental impact statement. The action alternatives represent differing scenarios for the management of Cumberland Gap National Historical Park over the next 15 to 20 years. These alternatives were developed to present viable solutions to issues identified in Chapter 1.

This section assesses the effects of the alternatives according to the requirements of Section 106 of the National Historic Preservation Act. The method for conducting this assessment is summarized in the section entitled "Section 106 Methodology" for Cultural Resources. This section also outlines a series of best management practices that would help avoid adverse effects on cultural resources. Significant cultural resources would be managed to protect values in accordance with NPS Management Policies (2006a) and Director's Order 28: Cultural Resource Management (1998c).

Archeological Resources

As of August 2008, the NPS Archeological Sites Management Information Systems contained entries for 136 archeological sites in the park. Of the known sites, 92 are in Kentucky, 9 are in Tennessee, and 35 are in Virginia. In the last five years, most of the sites have been re-located and examined for condition issues. Currently, 116 are listed in Good condition, 5 in Fair condition, and 6 in Poor condition. Nine others have not been checked. Most of the sites have been photographed and recorded with a GPS. It should be noted there are several sites currently classified as "potential" that may be added once they have been found and verified. Also, additional entries are expected once the results of projects conducted during FY2008 are available.

Only a minute portion of the park has ever been examined beyond the cursory pedestrian level so the depth of information is limited. The majority of the sites are historic because these tend to have visible

surface features and/or artifacts, whereas very few surveys have been conducted using methodologies that detect prehistoric sites. The list includes 57 domestic sites such as house and farmsteads, generally occupied during the early 20th century. There are also several manufacturing sites such as a brewery and coal processing facility. At least three coal mines have been identified. Transportation-related resources include three railroads and six roads. As for the Civil War, the database currently includes four camps, six forts, nine rifle pits, seven batteries and several other related sites. Smaller categories of historic sites include a school, hotels and a tavern. Prehistoric sites include ten rockshelters and caves, plus three other sites. Wherever new construction is proposed in the park, the area of potential effect would be inventoried and resources would be evaluated for National Register eligibility. Fern Lake and its watershed would be inventoried in the future and its resources would be evaluated to ensure that resources are not inadvertently damaged by visitor use or facility construction, operation, and use.

Alternative A would not involve establishment of updated cultural resource zones within the park, and thus would not result in the best possible management strategy for cultural sites. Two Cultural Resource Zones are proposed for each of the two action alternatives (B and C). These Cultural Resource Zones would encompass cultural resources within the Cumberland Gap and Hensley Settlement historic districts. These Cultural Zones would have a good potential for inventory, preservation, and protection of archeological sites. Generally, development and recreational activities would be situated in areas lacking archeological resources, or where sites could accommodate use without damage. New facilities such as parking and a rustic composting comfort station would be added at the Hensley Settlement to accommodate visitor use. Educational experiences would encourage stewardship.

Significant cultural resources would be managed to protect values in accordance with NPS Management Policies (2006) and Director's Order 28. Development of resource stewardship strategies and a collections management plan would aid the park in identifying and managing their resources more effectively by establishing priorities and schedules for resource treatment and by defining measures for site maintenance protection, and preservation, both within and outside of the Cultural Resource Zones.

Once planning for improvements under the preferred alternative has begun, an appropriate site-specific environmental document (likely an environmental assessment) would be developed to address potential impacts on cultural sites. Section 106 compliance would be included as part of or along with the development of this environmental document.

Conclusions

With protective measures such as prior identification of resources and avoidance of significant sites, implementation of Alternative B would have **no effect** on some archeological resources, and **no adverse effects** on others from development of new access routes, parking, visitor use, and natural processes. Educational, interpretive, outreach, and management efforts under Alternative C would be beneficial to archeological resources and effects from development actions, creation of new access routes/connections, and increased visitor use would have a **no adverse effect** on these cultural resources.

Under both action alternatives, past and continuing effects of development and other factors outside the park would contribute to have **adverse** cumulative effects on archeological resources now and in the future.

Cultural Landscapes, Buildings, Structures, and Districts

At Cumberland Gap, the park's historic structures and sites are among the most important elements in the two potential cultural landscapes. While none of the landscapes at Cumberland Gap National Historical Park have been formally inventoried or designated as cultural landscapes, two historic areas of the park, the Hensley Settlement and Cumberland Gap Historic District, include many characteristics of a cultural landscape. Thirty-five structures within the Hensley Settlement have been designated as the Historic District, which is eligible for the National Register of Historic Places. Cumberland Gap Historic District includes both structures and sites. Numerous other sites and structures within the park are listed on or are eligible for the National Register of Historic Places.

Hensley Settlement consists of a community of 12 scattered farmsteads situated on an isolated plateau on Brush Mountain, first carved out of the wilderness during the 1800s and expanded by the Hensley and Gibbons families during the early 1900s. The cultural landscape at Hensley includes the buildings described above, as well as other landscape elements such as trails, meadows, native vegetation, spatial organization, transportation routes, and scenic mountain viewsheds. The strategic and isolated location of the settlement contributes to the landscape.

The Cumberland Gap Historic District forms a second potential cultural landscape within the park. This landscape was shaped by the geology of the area, native vegetation, and the associated landforms and spectacular viewsheds. For more than three centuries, human use of the Gap added transportation corridors, Civil War facilities, a variety of structures and landscape, and vegetation features, resulting in major changes to the original historic scene viewed by Daniel Boone and other Long Hunters. Recent removal of intrusive modern facilities and the restoration of the Gap, returned the overall area to the approximate historic setting/cultural landscape visible during the period from 1780 to 1810, and helped preserve historic resources at Civil War sites.

Under Alternatives B and C, the majority of the park's historic structures and buildings would be included within two Cultural Resource Zones that encompass the historic districts described in Chapter 3. Various mitigating measures would be implemented that would reduce the potential effects of constructing new facilities proposed in the action alternatives on these potential cultural landscapes, historic structures, buildings, and districts. These measures would include survey, analysis, and development of protective measures for cultural resources early in project development. Careful attention would be given to the compatibility of new facilities with the historic scene, including concern for design, size, scale, massing, workmanship, association, materials, and feeling. By development of mitigation measures such as use of vegetation and natural landscape contours to mask modern facilities, the intrusiveness of new or improved roads, trails, parking, and other visitor facilities would be reduced.

Conclusions

Under Alternative B, historic resources (cultural landscapes, buildings, structures, and districts) would be managed to maintain their resource condition and character. Special studies would aid in their management, and new facilities would be designed to merge gently into the surrounding landscape as well as being compatible with existing facilities. Although the number of new facilities would be limited, the increased size of the Cultural Resource Zone under Alternative B would enable the park to better define and focus management efforts to preserve important cultural resources.

These measures would result in benefits (**no adverse effects**) on many historic resources, and help ensure **no adverse effects** overall.

Implementation of Alternative C would provide increased and formalized public outreach, partnering, and educational programs, and result in expansion and enhancement of existing programs. There

would be slightly more facilities under Alternative C than under Alternative A (or B), likely resulting in increased visitor use, which could, in turn, increase the potential for damage to cultural sites. However, other provisions of Alternative C, such as avoidance of cultural resources when choosing facility sites, and increased communication and education opportunities would help to effectively balance resource protection with increased visitor use. Increased public awareness and attention to cultural resources would reduce the potential effects of Alternative C, resulting in **no adverse effects** on cultural landscapes, historic buildings, structures, and districts. Under both action alternatives, past and continuing effects of development and other factors outside the park would contribute to **adverse, cumulative effects** on cultural landscapes and historic resources, now and in the future.

Ethnographic Resources

Usually the term “ethnographic resources” refers to resources valued by American Indians with long-term cultural ties to a particular geographic area. Area history closely links American Indians to this region, but consultation with concerned tribes has not identified any Traditional Cultural Properties, sacred sites, or specific tribal concerns related to the park.

In this document, the term “ethnographic resources” is also used to refer to a special community of people, including the descendents of the original settlers, who have a shared identity and close relationship to the park. Despite having been physically relocated outside the park, this ethnographic community continues to assign significance to remembered places and lifestyles. They regularly come to the park for reunions and have a continuing interest in the management of park resources.

Under the action alternatives, establishment of Cultural Resource Zones would not have an effect on historic properties/ethnographic resources. Construction, operation, and use of a few new visitor facilities would increase the potential for encountering archeological sites related to prehistoric and historic human usage of the area and which may be valued by some groups. However, development of roads, trails, and other visitor facilities would also benefit tribal members who may come here as visitors.

A similar scenario exists for the descendents of the area’s early settlers; e.g., development could alter remembered landscapes and familiar places. On the other hand, preservation of the Hensley Settlement and enhanced interpretation of pioneer life at the park would continue to give the descendents’ children and grandchildren a deeper awareness of the past their ancestors created here.

The various interpretive, outreach, education, and partnering programs planned under the action alternatives aid in providing education and an understanding of the park’s ethnographic resources.

Both action alternatives would benefit ethnographic resources through preservation of traditional places and resources. However, changes in the historic districts, and new visitor facilities proposed under Alternatives B and C could be viewed by some members of ethnographic groups as a negative action, while others would welcome the preservation of and access to traditional places like the Hensley Settlement. Overall, ethnographic resources would be affected under these alternatives, but the effect would not be adverse (**no adverse effect**).

Cumulative effects under either of the action alternatives would be an **adverse effect** because of the continuing loss of cultural traditions and places both locally and regionally.

Compliance

This general management plan/environmental impact statement will be sent to the Kentucky, Virginia, and Tennessee State Historic Preservation Officers, Tribal Historic Preservation Officers, and affiliated American Indian tribes for their review and comment (a listing of these tribes is contained in

the “Consultation and Coordination” section of this document). A list of other government, non-government organizations and other interested parties is provided in Chapter 6.

An environmental assessment or other appropriate site specific environmental compliance document would be prepared prior to implementation of any actions described in this general management plan/environmental impact statement that would affect cultural sites. Applying 36 CFR 800.5, the implementing regulations of the National Historic Preservation Act (revised regulations effective August 5, 2004) that address the criteria of effect and adverse effect, the NPS finds that implementation of Alternative B or Alternative C would have an effect on National Register-eligible and listed archeological and ethnographic resources and historic structures, buildings, objects and cultural landscapes, but that this effect would not be adverse (**no adverse effect**).

SOCIOECONOMICS

Regulations and Policies

Regulations and policies that guide NPS actions with respect to socioeconomics are summarized in the “Service-wide Mandates and Policies” section of Chapter 1 and in Appendix B.

Method

Socioeconomic issues tied to management actions proposed in this plan include: those related to increasing the levels of partnering and outreach to raise awareness of the park and secondarily draw more people to the area; and conducting additional outreach and educational activities. Major assumptions used in the analysis of effects on socioeconomics were: (1) an increase in visitation at the park or an increase in length of stay at the park would benefit the economy of the tri-state area due to increased spending by visitors for food, lodging, and other goods; (2) construction activities at the park would benefit the economy of the tri-state area by utilizing area contractors and building suppliers; (3) an increase in partnering, outreach, and education by the park would benefit the economy of the tri-state area by making more people aware of the park and its features; this would attract more visitors to the park and to the area; and (4) significant increases in park spending or visitation at the park could result in increased employment and population in the tri-state area.

This impact topic addresses the effects of implementing the alternative management strategies on the socioeconomics of the area, including population, employment, and tourism. The geographic area of influence analyzed for possible effects on socioeconomics includes the tri-state area surrounding the park. As the general management plan alternatives are conceptual in nature, the analysis of anticipated effects will be qualitative, rather than quantitative. Thresholds for this impact topic are presented in Table 29.

Table 29. Impact Thresholds for Socioeconomics

Negligible:	No effects would occur or the effects to socioeconomic conditions would be below the level of detection.
Minor:	The effects to socioeconomic conditions would be detectable. If mitigation were needed to offset potential adverse effects, it would be simple and successful.
Moderate:	The effects to socioeconomic conditions would be readily apparent. If mitigation is needed to offset potential adverse effects, it could be extensive, but would most likely be successful.
Major:	The effects to socioeconomic conditions would be readily apparent and would cause substantial changes to socioeconomic conditions in the region. Mitigation measures to offset potential adverse effects would be extensive and their success could not be guaranteed.
Duration:	Long-term: Effects last more than 1 year. Short-term: Effects last less than 1 year.

Impacts of Alternative A

Under Alternative A, the only future construction proposed in the park would be a composting comfort station at Fern Lake. Therefore, there would be limited new facilities to attract additional visitors to the park and to the tri-state area.

Under Alternative A, acquisition of the Fern Lake watershed would be completed by the NPS, and it is anticipated that Fern Lake would be opened for visitor use in the future. This could result in increased visitation to this area of the park, with potential minor socioeconomic benefits to local communities as more visitors would have the potential to spend more money in the area.

Continuation of existing levels of education and outreach would occur under Alternative A. The existing levels of informal partnering with caving groups, educational institutions, Daughters of the American Revolution, Wilderness Road State Park, and other organizations would also be maintained. Nature and cultural fairs would continue to draw thousands of people to the park and area every year. These continued activities would have **short-term and long-term, moderate, beneficial effects** on the socioeconomic conditions in the area and region.

The overall effect of continued management practices under Alternative A on socioeconomics would be **long- and short-term, moderate and beneficial**.

Cumulative Impacts

Under Alternative A, the cumulative effects on socioeconomics would be influenced by park actions, as well as by activities outside the park. Within the park, previous projects such as the Wilderness Road preservation project, the Daniel Boone visitor contact center, Hensley Settlement restoration, Civic Park improvements, the rehabilitation of the main visitor center, the Wilderness Road Campground improvements, and the restoration of Gap Cave would continue to benefit the regional economy by providing improvements to the park that would encourage visitors to return, attract additional visitors, and potentially encourage a longer stay in the park.

Outside of the park, the Wilderness Road State Park, Pine Mountain State Park, and Natural Tunnel State Park have benefited the regional economy by attracting visitors to the area. However, removal of U.S. 25E and construction and operation of the tunnel has resulted in the diversion of traffic away from the town of Cumberland Gap. The park has also cooperated with the town to help address this reduction in local tourism through use of appropriate signage along U.S. 25E. By providing a short cut between I-81 and I-75, the multi-laning of U.S. 25E has benefited the local economy by attracting motorists into the tri-state area. Relocation of the Glacier Girl exhibit could adversely affect the regional economy since visitors who previously came to see the exhibit may no longer come to Middlesboro and/or the park.

The three business parks listed in “Cumulative Impact Analysis” section of Chapter 4—Bell County Technology and Training Park and Lee County Industrial Park— would benefit the regional economy in the future by encouraging new businesses to locate into the tri-state area and by supplying new jobs to area residents. The proposed Pine Mountain Historical Trail could also attract new visitors to the area that could benefit the regional economy if they return in the future and vacation in the area. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting socioeconomics are combined with actions under Alternative A, the resulting regional cumulative effects would be **long-and short-term, moderate and beneficial**.

Conclusions

The overall regional effect of continued management practices under Alternative A on socioeconomic conditions would be **long- and short-term, moderate and beneficial**. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting socioeconomics are combined with actions under Alternative A, the resulting cumulative effects would be **long-and short-term, moderate and beneficial**.

Impacts of Alternative B

Alternative B would also feature expansion of the Developed Zones as compared to Alternative A. This could potentially result in the construction and operation of a few new facilities in Developed Zones at Fern Lake, Hensley Settlement, and in the vicinity of the Wilderness Road Campground. These facilities could potentially include comfort stations, visitor contact stations, picnic facilities, unpaved trails, limited paved roads, and paved parking areas. Parking areas and additional roadways could also be added at the Hensley Settlement in the new Developed Zone. Other potential improvements could include shelters, kiosks, limited paved parking areas, limited paved access roads, picnic tables, and comfort stations. Construction of these facilities would have a **short-term, minor, beneficial effect** on the local economy associated with providing local construction jobs (if hired locally) as well as workers spending money in the local communities.

Operation of the new facilities could attract more visitors to the park, as well as to the tri-state area, and visitors would spend money in the local marketplace. Fern Lake would be open to visitors with opportunities for fishing and non-motorized boating/electric trolling motor boating. Appropriate activities in the area surrounding the lake would include hiking, picnicking, horseback riding, and other outdoor activities that could attract new visitors to the park, with resulting benefits to the local economy. Because the new facilities would be minor and few in number, however, the overall effect of Alternative B on socioeconomics would be **long-term, minor, and beneficial**.

The expanded Developed Zone at the Hensley Settlement would provide an opportunity for concessions to provide wagon rides and additional guided tours, which would have a **long-term, minor, and beneficial effect** on the local economy in the future.

Under Alternative B, partnering, education, and outreach would remain at current levels as described in Alternative A. This would have a **long-term, moderate, beneficial effect** on the economy of the Middlesboro area by drawing visitors to the park for major events such as cultural fairs. .

It is estimated that Alternative B would require approximately four additional (full-time equivalent) park employees to assist with increased management needs at Fern Lake and the Hensley Settlement. Depending on the expertise required, these additional positions would either be filled locally or would be transferred in from other parks, or be new hires to the NPS. This would provide a **long-term, negligible, beneficial effect** on the local economy.

The overall effect of management actions proposed under Alternative B on socioeconomics would be **long-and short-term, moderate, and beneficial**.

Cumulative Impacts

The new facilities that would be constructed and operated under Alternative B would be of limited size and few in number. Economic gain to the local area and region would, therefore, be minor. Therefore, the cumulative effects of Alternative B are estimated to be similar to those described in Alternative A. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting socioeconomics are combined with actions

under Alternative B, the resulting cumulative effects would be **long- and short-term, moderate and beneficial**.

Conclusions

The overall effect of Alternative B on socioeconomics would be **long- and short-term, moderate, and beneficial**. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting socioeconomics are combined with actions under Alternative B, the resulting cumulative effects would be **long- and short-term, moderate and beneficial**.

Impacts of Alternative C, the Preferred Alternative

As compared to Alternative A, Alternative C would provide for larger and more numerous Developed Zones, increased potential for new facilities, and increased visitor access. This would increase the potential for providing local and regional economic benefits associated with construction and operation of these new facilities. In addition, 11 new minor facilities in Developed Zones at the Hensley Settlement (including the base of Brush Mountain), Fern Lake, and the Wilderness Road Campground would be proposed for construction. These construction activities would result in **short-term, minor, beneficial economic effects** (see Chapter 2 for detailed information on these potential projects).

Operation of the new facilities could attract more visitors to the park, as well as the tri-state area, and the visitors would be expected to spend money in the local market over the long- and short-term. This would result in **long-term, minor, beneficial economic effects on the local economy**.

The expanded Developed Zone at the Hensley Settlement would provide an opportunity for concessions to provide wagon rides and additional guided tours, which would have a **long-term, minor, and beneficial** effect on the local economy in the future.

Education and outreach programs would be expanded as well as the potential for more special events as compared with Alternative A. The park may choose to host additional events or programs for example at Fern Lake and the Hensley Settlement. Opportunities to visit Fern Lake may bring new visitors or increase the length of stay at the park. This could result in more overnight stays and increased spending in the communities near the park. Partnering opportunities, including formal partnering programs, would also be expanded under Alternative C. Examples of potential partnerships include the Cave Research Foundation and trail organizations. This could result in a **long-term, minor, beneficial effect** on the local economy of local communities through increased visitation.

It is estimated that Alternative C would require approximately 7.2 additional (full-time equivalent) employees. Four of these new employees would assist with management activities at Fern Lake and 3.2 full-time equivalent employees would be utilized to provide additional interpretation functions. Depending on the expertise required, these additional positions would either be filled locally, would be transferred from other parks, or be new NPS hires. This would result in a **long-term, negligible, beneficial effect** on the local economy.

The overall effect of management actions proposed under Alternative C on socioeconomics would be **long- and short-term, negligible to moderate and beneficial**.

Cumulative Impacts

The cumulative effects of management actions taken under Alternative C on socioeconomics would be similar to those associated with Alternative B, except that Alternative C would result in a slightly

greater potential for local and regional economic benefits. These would result from the larger Developed Zone in Alternative C than is relegated in Alternative A, and the construction and operation of 11 new minor facilities. Alternative C would also feature expanded education, outreach, and partnering programs. Together, these actions would result in increased visitor use, and a potential increase in the length of visitation in the park. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting socioeconomics are combined with actions under Alternative B, the resulting cumulative effects would be **long-and short-term, moderate and beneficial**.

Conclusions

The overall effect of Alternative C on socioeconomics would be **long- and short-term, negligible to moderate and beneficial**. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting socioeconomics are combined with actions under Alternative C, the resulting cumulative effects would be **long-and short-term, moderate and beneficial**.

VISITOR USE AND EXPERIENCE

Regulations and Policies

Regulations and policies that guide NPS actions with respect to visitor use and experience are summarized in the “Servicewide Mandates and Policies” section of Chapter 1 and in Appendix B.

Method

During scoping, the desire for identified for increased visitor access to important resources within the park and to nearby resources outside the park, while simultaneously protecting resources was identified as an issue. In addition, a need for increasing visitor safety on hiking trails by providing guided tours was also identified as an issue. Areas identified for providing increased access include the Hensley Settlement, mountain top areas, trails, and Fern Lake. Access in the park could be expanded through construction of additional facilities, including roads, horse trails and accommodations at the campground, bicycle and hiking trails, and satellite/trailhead parking areas, and visitor contact stations. Signage for roads and trails could be improved. The increased use of concessioners and NPS guided tours is also a means of providing additional access. To address these issues, a qualitative assessment of the effects of projected park actions on visitor use and experience was made, and the effects were compared to Alternative A. In addition, information on visitor use and experience was evaluated based on the professional judgment of NPS staff. Issues considered for visitor use and experience included features and facilities at the park, anticipated number of visitors, time spent at the park, opportunities for interpretation, opportunities for visitor contact, and accessibility. The geographic area of influence to be analyzed for possible effects on visitor use and experience includes the entire park. Boundaries for the cumulative impacts analysis are also set to correspond to the park boundary since visitor use and experience is primarily defined by actions within the park.

Major assumptions used in the analysis of effects on visitor use and experience include: (1) that under Alternative A, the existing management program for visitor use and experience would be extended into the future, and few or no new programs for visitors would be planned and implemented; (2) that under Alternative A, access to Fern Lake would be provided to visitors, but would be limited because of lack of facilities (however, four full time equivalent employees would be added under Alternative A to accommodate needs at Fern lake and the Hensley Settlement); (3) that access to Fern Lake and additional programs and features would be desirable to visitors, would attract additional visitors to the park, and would encourage visitors to remain in the park longer; and (4) that an increase in partnering,

outreach, and education by the park would provide a greater awareness of the park and its features, which would attract more visitors to the park.

Impact thresholds used for estimating the intensity of different types of effects on visitor use and experience are presented in Table 30.

Table 30. Impact Thresholds for Visitor Use and Experience

Negligible: Visitors would not be affected, or changes in visitor experience and/or understanding would be below or at the lowest level of detection. Visitors are not likely be aware of the effects associated with the alternative. Accessibility for individuals with disabilities would not be affected, or the effects would not be noticeable or measurable.	
Minor: Changes in visitor experience and/or understanding would be detectable, although the changes would be slight. Visitors could be slightly aware of effects associated with the alternative. Changes to reduce or increase accessibility would be noticeable, but would affect a small portion of the individuals with mobility-related disabilities who use the park.	
Moderate: Changes in visitor experience and/or understanding would be readily apparent. Visitors would be aware of the effects associated with the alternative and would most likely be able to express an opinion about the changes. Changes to reduce or increase accessibility would be readily apparent to many individuals with mobility-related disabilities who use the park.	
Major: Changes in visitor experience and/or understanding would be readily apparent and would have important consequences. Visitors would be aware of the effects associated with the alternative and would likely express a strong opinion about the changes. The effects on accessibility would be readily apparent to most individuals with mobility-related disabilities who use the park and would substantially change their ability to access and experience park features and resources.	
Duration:	Long-term: Changes would be recognized for more than one year. Short-term: Changes would be recognized for less than one year.

Impacts of Alternative A

Under Alternative A, there would be limited new facilities or features to attract additional visitors to the park. Other than a new composting comfort station at Fern Lake, no other new facilities would be constructed. Limited access to Fern Lake, lack of parking and access to Hensley Settlement, and lack of parking at Chadwell Gap Trailhead could continue to constrain visitor use and experience in these areas to some degree. Guided hiking tours would not be provided, except for NPS-guided tours of the Hensley Settlement as well as guided tours of Gap Cave. Some increase in visitation is expected at Fern Lake in the future because it would be opened for visitor use. This would be an improvement in the visitor's experience in this newly acquired part of the park.

Construction of the Cumberland Gap tunnel diverted traffic from the old route through the Cumberland Gap and enabled the restoration of the Wilderness Road. This, combined with the Daniel Boone visitor contact center, has resulted in increased numbers of visitors to the park, especially during nature and cultural fairs, typically attended by over 40,000 people from the area and region.

Continuation of existing levels of education and outreach would maintain current levels of visitor exposure to the park, with the likelihood that visitation levels by students and organized groups would remain at, or near their existing levels. Existing levels of informal partnering with caving groups, educational institutions, Daughters of the American Revolution, Wilderness Road State Park, and other organizations would be maintained. The overall effect of Alternative A on visitor use and experience would be **long-term, minor and beneficial** to those visitors who do not wish to see any changes in the park, and **long-term, moderate and adverse** to those who prefer more opportunities for a variety of experiences, partnerships, and access.

Cumulative Impacts

Under Alternative A, the cumulative effects on visitor use and experience would continue to be influenced by park management actions. Past projects described in Chapter 2 attracted additional visitors to the park and encouraged a longer stay in the park, and would be expected to continue to do so in the future. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting visitor use and experience are combined with actions under Alternative A, the resulting cumulative effects on visitor use and experience would be **long-and short-term, moderate to major, and beneficial**.

Conclusions

The overall effect of Alternative A on visitor use and experience would be **long-term, minor and beneficial** to those visitors who do not wish to see any changes in the park, and **long-term, moderate and adverse** to those who prefer more opportunities for a variety of experiences, partnerships, and access.

When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting visitor use and experience are combined with actions under Alternative A, the resulting cumulative effects would be **long- and short-term, moderate to major, and beneficial**.

Impacts of Alternative B

As compared to Alternative A, Alternative B would provide for larger and more numerous Developed Zones, greater potential for new facilities, and increased visitor access. In addition, construction of seven new minor facilities in Developed Zones at the Hensley Settlement, Fern Lake, and the Wilderness Road Campground would be constructed, and would potentially affect visitor experience (see Chapter 2 for detailed information on these projects).

Construction and operation of new facilities in these areas would have a **long-term, moderate, beneficial effect** on visitor experience by providing limited new ways to enjoy the park. New facilities could potentially include comfort stations, visitor contact stations, picnic facilities, unpaved trails, limited paved roads, and paved parking areas. Visitor use at Fern Lake by the public for fishing and non-motorized boating/electric trolling motor boating would be increased. The area surrounding the lake would also allow visitors hiking, picnicking, horseback riding, and other outdoor opportunities.

The three new facilities in Developed Zones at the Hensley Settlement would improve the quality and diversity of the visitor's experience by providing new interpretive exhibits, additional parking, and increased access for hikers and horseback riders in this area of the park. The expanded Developed Zone at Hensley Settlement could also provide the opportunity for concessioners to provide wagon rides and additional guided tours. Parking and additional roadways could also be added. Other potential new facilities could include shelters, kiosks, limited paved parking areas, limited paved access roads, picnic tables, and comfort stations. The recreational vehicle capacity of the Wilderness Road Campground would be increased by adding one additional electrical loop, providing a benefit to visitors.

Partnering, education, and outreach would remain at current levels as described in Alternative A. The effects on visitor experience would be similar to Alternative A.

New facilities and programs would add to the comfort and convenience of many visitors and would also add to the visitor's understanding of the park's features and significance. This could attract more visitors to the park and they may spend more time at the park as compared to Alternative A. The

overall effect of Alternative B on visitor use and experience park-wide would be **long-term, moderate to major, and beneficial** to those who prefer more opportunities for a variety of experiences, partnerships, and access. For those visitors who do not wish to see any changes in the park, the effects would be **long-term, moderate, and adverse**.

Cumulative Impacts

Cumulative effects of management actions proposed under Alternative B on visitor experience would be similar to those described for Alternative A, except that implementation of Alternative B would result in improvements in access and use of the park by visitors as a result of the construction and operation of a few limited additional facilities. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting visitor experience are combined with actions under Alternative B, the resulting cumulative effects would be **long-and short-term, major, and beneficial**.

Conclusions

The overall effect of Alternative B on visitor use and experience park-wide would be **long-term, moderate to major, and beneficial** to those who prefer more opportunities for a variety of experiences, partnerships, and access. For those visitors who do not wish to see any changes in the park, the effects would be **long-term, moderate, and adverse**. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting visitor experience are combined with actions under Alternative B, the resulting cumulative effects would be **long-and short-term, major, and beneficial**.

Impacts of Alternative C, the Preferred Alternative

As compared to Alternative A, Alternative C would provide for larger and more numerous Developed Zones, greater potential for new facilities, and increased visitor access compared to Alternative A. In addition, construction of 11 new minor facilities in Developed Zones at the Hensley Settlement, the base of Brush Mountain, Fern Lake, and the Wilderness Road Campground would be proposed for construction. The effects of these actions on visitor experience would be similar to Alternative B, except that Alternative C would provide slightly added improvements in the quality and diversity of the visitor experience. In addition, education and outreach programs would be expanded; more than in Alternative A. Formal partnering programs would be developed with caving groups and other groups in Alternative C. The park could, therefore, host additional events or programs and provide additional interpretation at Fern Lake, Gap Cave, or the Hensley Settlement. Beneficial effects on visitor experience could result from the expanded access and use of Fern Lake and the Hensley Settlement (which could include, for example, increased numbers of guided tours of the settlement). Formalized partnerships and programs, for example, with cave organizations, would likely result in increased visitation to Gap Cave and other caves in the park, which would have a **long-term, minor to moderate, beneficial effect** on visitor use.

The overall effect of Alternative C on visitor use and experience park-wide would be **long-term, moderate to major, and beneficial** to those who prefer more opportunities for a variety of experiences, partnerships, and access. For those visitors who do not wish to see any changes in the park, the effects would be long-term, moderate, and adverse.

Cumulative Impacts

Cumulative effects of management actions proposed under Alternative C on visitor use and experience would be similar to those described for Alternative B. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting

visitor experience are combined with actions under Alternative C, the resulting cumulative effects would be **long-and short-term, major, and beneficial**.

Conclusions

The overall effect of Alternative C on visitor use and experience would be **long-term, moderate to major, adverse and beneficial**. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting visitor use and experience are combined with actions under Alternative C, the resulting cumulative effects would be **long-and short-term, major, and beneficial**.

SCENIC RESOURCES AND VISUAL QUALITY

Regulations and Policies

Regulations and policies that guide NPS actions with respect to scenic resources and visual quality are summarized in the “Servicewide Mandates and Policies” section of Chapter 1 and in Appendix B.

Method

Issues regarding scenic resources and visual quality identified during public meetings and planning workshops included preservation of overall scenic qualities of the park, and protection of the numerous viewsheds that currently exist throughout the park, such as those at the Pinnacle and the Hensley Settlement.

To address these issues, a qualitative assessment of the effects of projected park actions on scenic resources/visual quality was made, and the effects were compared to Alternative A. In addition, information on scenic resources/visual quality was evaluated based on the professional judgment of NPS staff. Features considered regarding scenic resources and visual quality included views of natural and historic resources in the viewshed and sight distance. The geographic area of influence analyzed for possible effects on scenic resources and visual quality includes the entire park. The boundaries for the cumulative impacts analysis are also set to correspond to the park boundary since scenic resources/visual quality are primarily defined by actions taken within the park. Scenic resources and visual quality can be affected by activities outside the park and may be considered from a near-view perspective of a visitor’s immediate surroundings or the view from scenic overlooks that encompass long distances and access outside the park’s boundaries.

Major assumptions used in the analysis of effects on scenic resources and visual quality include: (1) that access to Fern Lake and additional programs and features would be desirable to visitors, would attract additional visitors to the park, and would encourage visitors to remain in the park longer; (2) that an increase in partnering, outreach, and education by the park would provide a greater awareness of the park and its features, which would attract more visitors to the park; (3) that the acquisition of the Fern Lake watershed positively affects the viewshed from Pinnacle Overlook. However, the park would be unable to fully protect the viewshed within the Fern Lake watershed; (4) that the viewshed from White Rocks is related to development activity to the south of the park in Lee County, Virginia; and (5) proposed construction of new park facilities would not introduce new sources of outdoor light and, therefore, would not affect views of the night sky. It is assumed that the park would work with Lee County officials to ensure approval of compatible land uses in the viewshed from White Rocks.

Impact thresholds used for estimating the intensity of different types of effects on scenic resources and visual quality are presented in Table 31.

Table 31. Impact Thresholds for Scenic Resources and Visual Quality

Negligible: Effects to the scenic resources and visual quality of the landscape would be at or below the level of detection; changes would be so slight that they would not be of any measurable or perceptible consequence to the visitor experience.
Minor: Effects to the scenic resources and visual quality of the landscape would be of little consequence to the visitor experience. Mitigation measures, if needed to offset adverse effects, would be simple and successful.
Moderate: Effects to the scenic resources and visual quality of the landscape would be readily detectable. Mitigation measures, if needed to offset adverse effects, would be extensive and likely successful.
Major: Effects to the scenic resources and visual quality of the landscape would be obvious, with substantial consequences to the visitor experience. Extensive mitigation measures would be needed to offset any adverse effects and their success would not be guaranteed.
Duration: Long-term: Changes would be recognized for more than one year. Short-term: Changes would be recognized for less than one year.

Impacts of Alternative A

Other than the new composting comfort station at Fern Lake, there would be no new structures that would affect the scenic quality of the park. Alternative A would not include any other human-made structures, construction, or vehicle access in the park that could affect scenic qualities. Management actions described for the Recommended Wilderness Zone would continue to preserve scenic resources.

Scenic vistas, from most vantage points within the park, would not be expected to change under Alternative A. Views from scenic vantage points in the park would be maintained, while development activity outside the park could affect scenic resources and visual quality in the future, depending on the type and nature of as yet unknown or planned future developments.

The acquisition of the Fern Lake watershed protects the scenic resources and visual quality of this area into the future. The viewshed from White Rocks is determined by development in the area to the south and outside the park in Lee County, Virginia. Most of the property adjacent to the park is zoned as agricultural, but some of the land along U.S. 58 is zoned for residential, commercial, and manufacturing. The overall effect of Alternative A on maintaining scenic resources and visual quality would, therefore, be **long-and short-term, minor, and beneficial**.

Cumulative Impacts

Under Alternative A, the cumulative effects on scenic resources and visual quality would be influenced by actions outside of the park. Declaration of the Fern Lake watershed as being unsuitable for coal mining (Federal Register: September 23, 1996) and later NPS acquisition of the Fern Lake watershed had a major, beneficial effect by protecting the viewshed at Pinnacle Overlook. The viewshed from White Rocks may change in the future if the land along U.S. 58 is developed. Lee County officials indicate that the improvement of U.S. 58 could encourage additional development along the corridor near the park (Lee County 2004). Except for the area near the White Cliffs, the viewsheds from the Natural Zone and Recommended Wilderness Zone would not be expected to change, nor would other viewsheds from other zones in the park. Designation of 14,091 acres as Recommended Wilderness provided for continued protection of the natural scenic qualities of the majority of the park. The Wilderness Road preservation project also provided for major scenic improvements in the park. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future

plans, projects, and activities affecting viewshed are combined with actions under Alternative A, the resulting cumulative effects would be **long-and short-term, major, and beneficial**.

Conclusions

The overall effect of Alternative A on scenic resources and visual quality would be **long-and short-term, minor, and beneficial**. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting scenic resources and visual quality are combined with actions under Alternative A, the resulting cumulative effects would be **long-and short-term, major, and beneficial**.

Impacts of Alternative B

As compared to Alternative A, Alternative B would provide for larger and more numerous Developed Zones, and a greater potential for new facilities, and increased visitor access compared to Alternative A. In addition, construction of seven new minor facilities in Developed Zones at the Hensley Settlement, Fern Lake, and the Wilderness Road Campground would be constructed, and would potentially affect scenic resources and visual quality (see Chapter 2 for detailed information on these projects) in the immediate area where construction would occur.

The number and size of the various new minor facilities under Alternative B would be limited, and built using sustainable building practices using materials and methods that would minimize the footprint on the landscape. These practices would minimize adverse effects to the scenic resources of the park.

The overall effect of Alternative B on scenic resources and the visual quality of the park would be **long- and short-term, minor, and adverse**.

Cumulative Impacts

Cumulative effects of management actions proposed under Alternative B on scenic resources and visual quality would be similar to those in Alternative A, except construction of a few, limited facilities could have a **long- and short-term, minor, adverse** cumulative effect on scenic resources/visual quality.

When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting scenic resources and visual quality are combined with actions under Alternative B, the resulting cumulative effects would be **long-and short-term, minor and adverse**.

Conclusions

The overall effect of Alternative B on scenic resources and visual quality would be **long-and short-term, minor, and adverse**.

When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting scenic resources and visual quality are combined with actions under Alternative B, the resulting cumulative effects would be **long-and short-term, minor, and adverse**.

Impacts of Alternative C, the Preferred Alternative

As compared to Alternative A, Alternative C would provide for larger and more numerous Developed Zones, greater potential for new facilities, and increased visitor access compared to Alternative A. In

addition, construction of 11 new minor facilities in Developed Zones at the Hensley Settlement, the base of Brush Mountain, Fern Lake, and the Wilderness Road Campground would be proposed for construction. The effects of Alternative C on scenic resources and visual quality of the park would be similar to those in Alternative B. The overall effect of Alternative C on scenic resources and visual quality of the park would be **long- and short-term, minor, and adverse**.

Cumulative Impacts

Cumulative effects of Alternative C on the park's scenic resources and visual quality would be similar to Alternative B. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting scenic resources and visual quality are combined with actions under Alternative C, the resulting cumulative effects would be **long-and short-term, minor, and adverse**.

Conclusions

The overall effect of Alternative C on scenic resources and visual quality would be **long- and short-term, minor, and adverse**. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting scenic resources and visual quality are combined with actions under Alternative C, the resulting cumulative effects would be **long-and short-term, minor, and adverse**.

TRANSPORTATION

Regulations and Policies

The regulations and policies that guide NPS actions with respect to transportation resources are summarized in the "Service-wide Mandates and Policies" section of Chapter 1 and in Appendix B.

Method

The primary transportation issue identified during public scoping meetings included the desire to provide increased access to the park. Specifically, the public expressed a desire for more transportation access to the Hensley Settlement and Fern Lake, additional trails that connect with areas outside the park, additional horseback riding and mountain biking trails, improved trailheads, and improved signage. Tunnel safety was also identified as an issue.

The area analyzed for possible effects includes the park and sections of the roadways accessing the park in the neighboring four counties. Major assumptions used in the analysis were: (1) a qualitative analysis was prepared, since information on future year traffic estimates were not available; (2) facilities and programs that would increase visitation at the park and increase the average length of stay for visitors would increase traffic volumes on park and area roadways; (3) actions that would increase the population or employment in the region would increase the visitation at the park; (4) an increase in traffic on U.S. 25E through the Gap Tunnel (a park road) does not necessarily lead to an increase in the number of visitors coming into the park; and (5) there would be no changes in the manner in which the tunnel would be managed, thereby maintaining safe operations.

Impact thresholds used for estimating the intensity of different types of effects on transportation resources are presented in Table 32.

Table 32. Impact Thresholds for Transportation

Negligible: No effects would occur, or the effects to transportation would be below the level of detection.	
Minor: Effects to transportation would be detectable. If mitigation measures were needed to offset potential adverse effects, they would be simple and successful.	
Moderate: The effects to transportation would be readily apparent. If mitigation measures were needed to offset potential adverse effects, they could be extensive, but would most likely be successful.	
Major: The effects to transportation would be readily apparent and would cause substantial changes. Mitigation measures to offset potential adverse effects would be extensive and their success could not be guaranteed.	
Duration:	Long-term: Takes more than one year to recover. Short-term: Recovers within one year.

Impacts of Alternative A

There would be no new transportation projects proposed to under Alternative A. No major new trails for hiking, horseback riding, or mountain biking would be added to the park. Increased public access to Fern Lake could increase visitation to this area of the park. No additional access would be provided to Sugar Run, Pinnacle Overlook, Hensley Settlement, Martin's Fork, KY 988 and Pinnacle Road. Lack of parking at Hensley Settlement and Chadwell Gap Trailhead would continue as there would be no transportation improvements constructed in this alternative. Continuation of existing levels of education and outreach and partnering with caving groups, educational institutions, Daughters of the American Revolution, Wilderness Road State Park and other organizations would be maintained at current levels. The overall effect of Alternative A on transportation would be **long-term, minor and adverse**.

Cumulative Effects

Under Alternative A, the cumulative effects on transportation inside the park would be controlled primarily by park management actions. Cumulative effects on transportation on the access roads to the park would be largely controlled by municipal and federal activities outside the park. Past projects in the park described in Chapter 2 have attracted, and would continue to attract, additional visitors to the park and would encourage a longer stay in the park.

Prior to federal ownership of the park, the creation of Fern Lake by damming the Little Yellow River by private interests created a private recreational venue as well as a public water supply. These activities have attracted, and will continue to attract, additional visitors to the park who require access and parking. The declaration of Fern Lake watershed as unsuitable for coal mining (Federal Register: September 23, 1996) resulted in the elimination of mining in the vicinity of the park and, therefore, fewer trucks and employee vehicles on the road to Fern Lake. Acquisition of the Fern Lake watershed provides increased opportunities for park visitors, which may increase parking and roadway maintenance needs in the long-term.

Construction of the Cumberland Gap tunnel diverted traffic from the old route through the Cumberland Gap and enabled the restoration of the Wilderness Road. This, combined with the Daniel Boone visitor contact center, has resulted in increased numbers of visitors to the park, especially during nature and cultural fairs, typically attended by over 40,000 people from the area and region. Improvements made in 2007 resulted in the temporary closure of a portion of the tunnel, but these improved the stability necessary for continued safe travel. Multi-laning of U.S. 25E created a short cut

between I-81 and I-75 and also contributed to attracting additional visitors to the U.S. 25E tunnel. However, most of these “visitors” passed through the park in several minutes without stopping to enjoy the park and, therefore, historically have not consumed parking or roadway capacity beyond the tunnel. There would be no changes in the manner in which the tunnel would be managed, thereby maintaining safe operations.

State parks in the area, including Wilderness Road State Park, Pine Mountain State Park, and Natural Tunnel State Park, attract visitors from around the region. These visitors consume transportation capacity on U.S. 25E and U.S. 58. The proposed industrial parks in the region, including the three business parks listed in the “Cumulative Impact Analysis” section of Chapter 4, would attract new businesses to the area, which could, in turn, attract new residents. This would add traffic to the area roadways, including U.S. 25E and U.S. 58.

When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting transportation are combined with actions under Alternative A, the resulting local and regional cumulative effects would be **long- and short-term, major and beneficial**.

Conclusions

The overall effect of continuing current management actions under Alternative A on transportation would be **long-term, minor, and adverse**. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting transportation are combined with actions under Alternative A, the resulting local and regional cumulative effects would be **long- and short-term, major, and beneficial**.

Impacts of Alternative B

As compared to Alternative A, Alternative B would provide for larger and more numerous Developed Zones, greater potential for new facilities, and increased visitor access. In addition, seven new minor facilities in Developed Zones at the Hensley Settlement, Fern Lake, and the Wilderness Road Campground would be proposed for construction and would potentially attract both park visitors and area residents. Visitors may also choose to visit other areas of the park, increasing the demand for transportation facilities throughout the park.

Under Alternative B, there could be additional guided tours and other activities at the Hensley Settlement. These opportunities could attract additional visitors to the park, which could create desires for additional parking and vehicle access problems. However, these increased needs should be alleviated with the proposed access and parking improvements. Access would be provided to the Developed Zones at Fern Lake. Access to the Pinnacle Overlook and Sugar Run would be alleviated by improving Pinnacle Road and KY 988. Access to the Hensley Settlement would be improved by adding a new parking facility to the west of the settlement at the base of Brush Mountain, by improving Shillalah Creek Road, and by expanding the parking area on the west side of the Hensley Settlement. Parking problems at the Chadwell Gap Trailhead would continue since there would be no facility constructed at this location under Alternative B. Education, outreach, and partnering would be the same as Alternative A, which would not change associated transportation patterns or volumes over those that currently exist. The overall effect of Alternative B on local transportation would be **long-term, minor, and beneficial**.

Cumulative Impacts

Under Alternative B, the cumulative effects on transportation inside the park would be controlled primarily by park actions similar to Alternative A. Cumulative effects on transportation on the access

roads to the park would be largely influenced by activities outside the park as described under Alternative A. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting transportation are combined with actions under Alternative B, the resulting cumulative effects would be **long- and short-term, major, and beneficial**.

Conclusions

The overall effect of management actions proposed under Alternative B on local transportation would be **long-term, minor, and beneficial**. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting transportation are combined with actions under Alternative B, the resulting cumulative effects would be **long- and short-term, major, and beneficial**.

Impacts of Alternative C, the Preferred Alternative

As compared to Alternative A, Alternative C would provide for larger and more numerous Developed Zones, greater potential for new facilities, and increased visitor access (see Chapter 2 for detailed information on these projects). In addition, construction of 11 new minor facilities in Developed Zones at the Hensley Settlement, the base of Brush Mountain, Fern Lake, and the Wilderness Road Campground would be constructed. These changes could attract additional visitors to the settlement and Fern Lake, requiring access and parking.

The larger Developed Zone to the west of Hensley Settlement includes a parking facility at the base of Brush Mountain that is a potential improvement to visitor access for this area, and an expanded parking area immediately west of the Hensley Settlement. The Developed Zone at Fern Lake would include an area to the south of the lake as well as a corridor that connects the visitor center to Fern Lake. These changes could provide a corridor for a park roadway, as well as trails for visitors. At the Wilderness Road Campground, several campsites would be reconstructed to accommodate horse trailers. In addition, some minor projects could also be constructed in other parts of the park. Facilities could include comfort stations, visitor contact stations, picnic facilities, unpaved trails, limited paved roads, and paved parking areas.

Education and outreach programs would be expanded as compared to Alternative A. The park may host additional events or programs and they may provide additional interpretative activities. Partnering opportunities would also be expanded as compared to Alternative A. Examples of potential new or formalized partnerships include those with the Cave Research Foundation and trail organizations. New facilities and programs could attract more visitors to the park and could also extend the visitors average length of stay. Additional visitors and their longer stay would require increased parking and access addressed by Alternative C. Parking problems at the Chadwell Gap trailhead would continue since there would be no new facilities at this location.

The overall effect of Alternative C on transportation would be **long-term, moderate, and beneficial**.

Cumulative Impacts

Cumulative effects of Alternative C on transportation would be similar to those associated with Alternative A. Under all the alternatives, including Alternative C, the cumulative effects on transportation inside the park would be influenced primarily by park actions. Cumulative effects on transportation on the access roads to the park would be largely controlled by activities outside the park. Additional road access and parking proposed under Alternative C would increase the transportation network in the park, adding to the cumulative long-term effects. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and

activities affecting transportation are combined with actions under Alternative C, the resulting cumulative effects would be **long- and short-term, major, and beneficial**.

Conclusions

The overall effect of Alternative C on transportation would be **long-term, moderate, and beneficial**. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting transportation are combined with actions under Alternative C, the resulting cumulative effects would be **long- and short-term, major, and beneficial**.

PARK OPERATIONS

Regulations and Policies

Regulations and policies that guide NPS actions with respect to park operations are summarized in the “Servicewide Mandates and Policies” section of Chapter 1 and in Appendix B.

Method

Park operations issues identified during public meetings and planning workshops included a desire for improved signage on roads and trails, the need for additional enforcement to properly manage visitor activities such as non motorized boating and outdoor recreation in Fern Lake and park-permitted rock climbing, expansion of education, outreach and partnering programs, additional interpretation activities, such as covered wagon rides, and increased numbers of guided tours, programs, demonstrations, and special events.

The area analyzed for possible effects on park operations includes the entire park. Major assumptions used in the analysis were: (1) a larger Developed Zone could result in more facilities being constructed, which could result in higher manpower requirements, including law enforcement, maintenance, and interpretation; (2) more facilities would result in higher levels of visitation and longer average stays; this would result in higher manpower requirements for law enforcement, maintenance (including long-term maintenance), and interpretation; (3) increased educational and interpretive programs and increased partnering and/or research initiatives would strain park operations without an increase in staffing; (4) a more extensive trail system would result in higher manpower requirements including maintenance and law enforcement; (5) additional population and employment in the tri-state area could result in additional visitation to the park and, therefore, higher manpower requirements including law enforcement, maintenance, and interpretation; (6) under Alternative A, the existing management programs would be extended into the future, few or no new programs for visitors would be planned and implemented, and Fern Lake was assumed to be part of the park; and (7) although increased staffing and funding are proposed under all three alternatives, implementation of the approved plan would depend on future funding and service-wide priorities. Approval of a general management plan does not guarantee that funding and staffing needed to implement the plan will be forthcoming. Funding for capital construction improvements is not currently shown in NPS construction programs, and it is likely that all capital improvements will not be totally implemented during the life of this general management plan. Larger capital improvements may be phased in over several years, and full implementation of the general management plan could be many years into the future.

The impact thresholds used for estimating the intensity of different types of effects on park operations are presented in Table 33.

Table 33. Impact Thresholds for Park Operations

Negligible: Effects on park operations would be at or below the level of detection.
Minor: Effects on park operations would be detectable. The change would be noticeable to staff, but probably not to the public.
Moderate: Effects on park operations would be readily apparent to staff and possibly to the public in terms of effects on the visitor experience.
Major: Effects on park operations would be readily apparent to staff and the public, and would result in substantial, widespread changes.
Duration: Long-term: Takes more than one year to recover. Short-term: Recovers within one year.

Impacts of Alternative A

Under the Alternative A, existing management strategies for operating the park would continue, with the exception of the addition of four full-time staff to provide visitor services for Fern Lake and the Hensley Settlement. Operations would continue to be based from existing facilities (park headquarters, visitor center, maintenance area, etc.) located in the Developed Zone at the Gap. The tunnel would continue to be serviced by the existing law enforcement staff at the park (prior to the tunnel, the park staff had no road-related enforcement duties).

Operational activities such as interpretation, inventory and monitoring, research, and resource management would continue to be conducted primarily from the park headquarters and visitor center with park interpretive activities conducted at designated areas throughout the park. Under Alternative A, access to the park would continue to be provided from existing locations. Maintenance of facilities would be expected to continue to require long-term investment of manpower and supporting dollars. Cyclic maintenance would continue for existing facilities into the future with no major changes.

Increased visitor access to Fern Lake would be expected as well as use of this area and lands adjacent to this portion of the park. Addition of four, new full-time equivalent park staff would help to address park operational requirements in this area, as well as at the Hensley Settlement. One of the responsibilities of the new staff would include the appropriate management of non motorized boating and outdoor recreation in Fern Lake, as a means of assuring that water quality of this drinking water reservoir is fully protected. Visitor services at Fern lake would be limited, however, due to no proposed new programs, or facilities other than a new composting comfort station. This would likely not fully achieve desired conditions to expand visitor interpretive ideas. New staff would also be involved in management of other activities in the park, including, for example, rock climbing (by permit, based on individuals merit and experience, and following evaluation in accordance with the National Environmental Policy Act).

Under the Alternative A, the boundaries and sizes of the existing Recommended Wilderness Areas (approximately 14,091 acres) would remain unchanged. Wilderness management efforts by the park would remain unchanged. No new wilderness areas would be proposed.

Continuation of existing levels of education, outreach, and informal partnering with caving groups, educational institutions, Daughters of the American Revolution, Wilderness Road State Park, and other organizations, would be maintained at current levels, which may not meet future demands. Interpretive activities would also be maintained at current levels, which would not adequately address visitor issues, nor would it meet demands in the future, thereby placing increased demands on existing staff.

The overall effect of Alternative A on park operations would be **long-term, minor, and adverse**.

Cumulative Impacts

Under Alternative A, the cumulative effects on operations would be controlled primarily by past and future actions inside the park. Past actions listed in Chapter 2 have attracted, and would continue to attract, additional visitors to the park and would encourage longer visitation in the future. These past and future actions could lead to a requirement for additional law enforcement, maintenance, and interpretive staff to meet the increased visitation demand. In addition, increased demand for use of the camp ground and other camp sites would place increased demands to maintain these facilities.

In addition to actions inside the park, certain actions outside the park have had, and would continue to have effects on park operations. For example, the multi-laning of U.S. 25E (to allow restoration of the Wilderness Road and improve safety conditions) created a short cut between I-81 and I-75, thereby attracting additional visitors to the U.S. 25E Cumberland Gap tunnel located inside the park. There would be no changes in the manner in which the tunnel would be managed, thereby maintaining safe operations. Although most of these “visitors” pass through the park in only a few minutes without stopping to enjoy the park, additional patrols of the tunnel and the approaches are required. The three business parks listed in “Cumulative Impact Analysis” section in Chapter 4 could also attract additional population to the tri-state area, which could place additional future demands on law enforcement, maintenance, and interpretive staff.

When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting park operations are combined with actions under Alternative A, the resulting cumulative effects would be **long- and short-term, moderate, and adverse**.

Conclusions

The overall effect of Alternative A management actions taken on park operations would be **long-term, minor, and adverse**. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting park operations are combined with actions under Alternative A, the resulting cumulative effects would be **long- and short-term, moderate, and adverse**.

Impacts of Alternative B

The effects of Alternative B on park operations would be similar to those described for Alternative A, except seven, minor new facilities could be constructed in Developed Zones at Fern Lake, the park headquarters area, Sugar Run, the campground/Gap area, and the Hensley Settlement. Similar to Alternative A, the tunnel would continue to be serviced by the existing law enforcement staff at the park (prior to the tunnel, the park staff had no road related enforcement duties). Creation of a new and larger Developed Zone as compared to Alternative A could also result in construction and operation of a limited number of other new park facilities. This would provide opportunities for additional visitor use of the park. These new activities would increase the level of effort required for interpretation, maintenance, and law enforcement. Cyclic maintenance requirements would increase relative to the amount of new facilities constructed and operated in the future compared to Alternative A.

Four (full time equivalent) employees would be added to existing staff in Alternative B, the same as proposed for Alternative A. It is likely that the park would be unable to fully achieve desired conditions in program areas such as resource protection, visitor services and interpretive activities.

The overall effect of management actions proposed under Alternative B on park operations would be **long-term, minor, and adverse**.

Cumulative Impacts

The effects of Alternative B on park operations would be similar to those defined for Alternative A, except under Alternative B some minor, new facilities would primarily be added in Developed Zones at the Hensley Settlement, Fern Lake, and the Wilderness Road Campground and possibly other areas of the park as prescribed by zone. These effects would be added to those of other projects and actions both inside and outside the park described previously, and would have a potential to place additional demands on law enforcement, maintenance, and interpretive staff. However, the addition of four new (full-time equivalents) staff members would offset the potentially adverse effects on park operations. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting park operations are combined with actions under Alternative B, the resulting cumulative effects would be **long- and short-term, moderate, and adverse**.

Conclusions

The overall effect of management actions proposed under Alternative B on park operations would be **long-term, minor, and adverse**. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting park operations are combined with actions under Alternative B, the resulting cumulative effects would be **long- and short-term, moderate, and adverse**.

Impacts of Alternative C, the Preferred Alternative

The effects of Alternative C would be similar to those described in Alternative B, except that a total of eleven new minor park facilities would be proposed for construction under Alternative C. Cyclic maintenance requirements would be greater than Alternative A, relative to the increase in facility construction and operation. This would potentially adversely effect park operations, but this would be offset by hiring 7.2 (full-time equivalent) employees, as compared to four under Alternative A. Under Alternative C, these staff members would assist park operations at Fern Lake, the Hensley Settlement, as well as serve the needs of expanded education, outreach, and formalized partnering programs.

Due to the increase in visitor services, and addition of park staff to address the operations support needs, the overall effect of management actions proposed under Alternative C on park operations would be **long-term, moderate and beneficial**.

Cumulative Impacts

Cumulative effects of Alternative C on park operations would be similar to those described for Alternative B, except that the construction of 11 new minor projects under Alternative C would contribute to the overall cumulative effect of past, present, and reasonably foreseeable projects. However, the addition of 7.2 full time equivalent employees would offset these potentially adverse effects on park operations. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting park operations are combined with actions under Alternative C, the resulting cumulative effects would be **long- and short-term, minor, and adverse**.

Conclusions

The overall effect of Alternative C on park operations would be **long-term, moderate, and beneficial**. When the beneficial and adverse effects of other past, present, and reasonably foreseeable

future plans, projects, and activities affecting park operations are combined with actions under Alternative C, the resulting cumulative effects would be **long- and short-term, minor, and adverse**.

CONCESSION OPERATIONS AND COMMERCIAL SERVICES

Regulations and Policies

Regulations and policies that guide NPS actions with respect to concession operations and commercial services are summarized in the “Servicewide Mandates and Policies” section of Chapter 1 and in Appendix B.

Method

Concession operations and commercial services issues identified during public meetings and planning workshops related primarily to increased numbers and types of services that would allow for increased visitor access to the park. Suggested services included additional guided tours and special events within the park and various types of concessions for lodging.

The area analyzed for possible effects on concession operations and commercial services includes the entirety of the park. Major assumptions used in the analysis were: (1) a qualitative analysis was prepared instead of a quantitative analysis as detailed information on potential commercial operations and projected visitation was not available; (2) there are no concessioners operating in the park under Alternative A; and (3) the potential for future commercial enterprises at the park would increase as visitation increased and as commercial proposals are evaluated on an individual basis for appropriate services in the park.

Impact thresholds used for estimating the intensity of different types of effects on concession operations and commercial services are presented in Table 34.

Table 34. Impact Thresholds for Concession Operations and Commercial Services

Negligible: Concession providers would not be affected, or changes in concession services would be below or at the level of detection. Any effects would be short-term. The concession provider would not likely be aware of the effects associated with the alternative.	
Minor: Changes in concession services would be detectable, although the changes would be minimal. The concession provider would be aware of the effects associated with the alternative, but the effects would be slight.	
Moderate: Changes in concession services would be readily apparent. The concession provider 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 concession services would be readily apparent and have important consequences. The concession provider would be aware of the effects associated with the alternative and would likely express a strong opinion about the changes.	
Duration:	Long-term: Takes more than one year to recover. Short-term: Recovers within one year.

Impacts of Alternative A

Limited new facilities (i.e., a new composting comfort station at Fern Lake) would be proposed for construction under Alternative A. Therefore, there would be limited opportunity for new concession operations or other commercial services that would require support facilities in the park. Every application for an individual business permit or new concession operation would be evaluated based on its own merit.

There would be limited new facilities to attract additional visitors to the park; therefore, the bookstore operated by Eastern National (partner) and the Wilderness Road Campground, Hensley Tour, and Gap Cave Tour would not be expected to see significant changes to their current use levels. This would likely not attract or support new commercial or concession opportunities.

There would be limited opportunities for concession or commercial operations at Fern Lake under Alternative A because Fern Lake, although open to the visitors in the future, would have limited visitor services and facilities. Nor would there likely be increased concession opportunities at Hensley Settlement or other areas of the park.

Continuation of existing levels of education and outreach and informal partnering with caving groups, educational institutions, Daughters of the American Revolution, Wilderness Road State Park, and other organizations would be maintained at current levels, which would not affect the current commercial operations at the park.

The overall effect of continuation of current management actions under Alternative A on concession operations and commercial services would be **long-term, moderate, and adverse**.

Cumulative Impacts

For all the alternatives, including Alternative A, the cumulative effects on concession operations and commercial services would be influenced primarily by park actions, but would also be influenced by outside actions that could increase visitation to the park. Actions listed in the “Cumulative Impact Analysis” section of Chapter 4 could benefit either existing or potential future concession operations or commercial services by attracting more visitors to the park. The services could be provided by either a concessioner or the NPS.

Area visitors to nearby Wilderness Road State Park, Pine Mountain State Park, and the Natural Tunnel State Park may also choose to visit Cumberland Gap National Historical Park while in the area. By providing a short cut between I-81 and I-75, the multi-laning of U.S. 25E between I-81 and I-75 has attracted motorists into the tri-state area who might choose to visit the park. These actions could lead to a future increase in visitation and would benefit concession operations and commercial services.

Relocation of the Glacier Girl exhibit away from Middleboro could reduce the number of tourists to the area, which, in turn, could adversely affect the number of visitors to the park. This could have an adverse effect on concession operators at the park as well. Upwards of 50,000 people came to Middlesboro to attend the Glacier Girl air show, and many of the people also visited the park, with resulting benefits to concession operations and commercial services.

The three business parks listed in the “Cumulative Impact Analysis” section of Chapter 4 could encourage new businesses to locate in the tri-state area and supply new jobs to area residents in the future. The new jobs could also attract new residents to the tri-state area and these new residents may choose to visit the park and utilize commercial services. The proposed Pine Mountain Historical Trail could also attract new visitors that may choose to visit the park and also use commercial services.

Considering the fact that no concessions currently operate in the park, any changes in the existing conditions would be readily apparent. Concession opportunities would not be expected to change radically in the future under Alternative A.

When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting concession operations and commercial services are combined with actions under Alternative A, the resulting cumulative effects would be **long- and short-term, minor, and beneficial**.

Conclusions

The overall effect of continued management actions taken under Alternative A on concession operations and commercial services would be **long-term, moderate and adverse**. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting concession operations and commercial services are combined with actions under Alternative A, the resulting cumulative effects would be **long- and short-term, minor, and beneficial**.

Impacts of Alternative B

Under Alternative B, potential opportunities for concessions and commercial services would increase as compared to Alternative A. Construction of a limited number of new facilities could occur in Developed Zones at Fern Lake, the park headquarters area, Sugar Run, the campground/Gap area, and the Hensley Settlement. Creation of a new Developed Zone at Fern Lake could result in construction and operation of a limited number of new park facilities in this area. This would provide opportunities for fishing and non-motorized and electric trolling motor boating for visitors to the park. These new activities could attract additional visitors as well as create opportunities for concession and commercial operations to provide these types of services to the visitors at Fern Lake in the future.

There could be additional guided tours and other activities at Hensley Settlement, as well as improved access via an improved Shillalah Creek Road and a new parking facility at the base of Brush Mountain. Additional tours and features, such as wagon rides, could be introduced at the Hensley Settlement, which could be provided by concessioners, once the park grants approval. Existing levels of education and outreach, and informal partnering with caving groups, educational institutions, Daughters of the American Revolution, Wilderness Road State Park, and other organizations would be maintained at current levels. This would not affect commercial operations at the park and related commercial/concession opportunities would be expected to be similar to existing conditions under Alternative A.

The overall effect of management actions proposed under Alternative B on concession operations and commercial services would be **long-term, moderate, and beneficial**.

Cumulative Impacts

Cumulative effects of Alternative B concession operations and commercial services are similar to those described for Alternative A. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting concession operations and commercial services are combined with actions under Alternative B, the resulting cumulative effects would be **long- and short-term, minor, and beneficial**.

Conclusions

The overall effect of management actions proposed under Alternative B on concession operations and commercial services would be **long-term, moderate, and beneficial**. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting concession operations and commercial services are combined with actions under Alternative B, the resulting cumulative effects would be **long- and short-term, minor, and beneficial**.

Impacts of Alternative C, the Preferred Alternative

Under Alternative C, potential opportunities for concession operations and commercial services would increase as compared to Alternative A. The effects on concession operations and commercial

services would be similar to those described for Alternative B, except that Alternative C would include the construction of 11 new minor facilities in the park. In addition, a corridor between Fern Lake and the Wilderness Road Campground would be established as part of the Developed Zone. This could provide additional opportunities for fishing and non-motorized and electric trolling motor boating for visitors to the park, and a means to establish a park roadway and trails for visitors in the new corridor. At the Wilderness Road Campground, several campsites would be reconstructed to accommodate horse trailers. In addition, some minor projects could also be constructed in other parts of the park. Facilities could include comfort stations, visitor contact stations, picnic facilities, unpaved trails, limited paved roads, and paved parking areas. Proposed opportunities for facility changes such as the campground improvement, the proposed Fern Lake facilities and other increased opportunities for access proposed near the Hensley Settlement, could attract additional visitors to the park, which could also boost existing commercial operations at the park and provide the opportunity for new concession and commercial operations, such as the possibility of personalized and/or group tours, wagon rides, boat rentals, and similar types of activities.

The overall effect of management actions proposed under Alternative C on concession operations and commercial services would be **long-term, moderate, and beneficial**.

Cumulative Impacts

Cumulative effects of management actions proposed under Alternative C on concession operations and commercial services would be similar to those described for Alternative B. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting concession operations and commercial services are combined with actions under Alternative C, the resulting cumulative effects would be **long- and short-term, minor, and beneficial**.

Conclusions

The overall effect of Alternative C on concession operations and commercial services would be **long-term, moderate, and beneficial**. When the beneficial and adverse effects of other past, present, and reasonably foreseeable future plans, projects, and activities affecting concession operations and commercial services are combined with actions under Alternative C, the resulting cumulative effects would be **long- and short-term, minor, and beneficial**.

SUSTAINABILITY AND LONG-TERM MANAGEMENT

The National Environmental Policy Act (sec. 101 (b)) and the NPS Organic Act require an assessment of the potential for each alternative to produce long-term effects and the potential of foreclosing future options available to the NPS with regard to managing each park. An alternative is required to allow for sustainable development, which is defined as an action that meets the needs of the present without compromising the ability of future generations to meet their needs (*World Commission on Environment and Development* in NPS 2001a). This section addresses the following three components of the sustainability assessment for each of the alternatives.

The Relationship between Local Short-Term Uses of the Environment and the Maintenance and Enhancement of Long-Term Productivity - National Environmental Policy Act (Section 102 (c) (IV))

Alternative A

As demand for visitor use and recreation in the park grows, the long-term protection and enjoyment of resources could be jeopardized in some areas of the park under Alternative A. Despite

implementation of a management strategy to provide continued protection of cultural and natural resources, there would likely continue to be instances where resources are disturbed by visitors. These impacts would be avoidable only if human use were not allowed in the park. Mitigation measures would be taken where possible to avoid and reduce these impacts. Continuation of the present effective management of natural and cultural resources, and the present active level of education, outreach and partnering programs would contribute to the long-term protection and preservation of resources. Continued coordination with local agencies, organizations, and other cooperative initiatives for resource and use management would enhance resource protection and protection of park natural and cultural resources.

Increased visitor use of Fern Lake is expected under Alternative A since the area will be opened to visitors. No new facilities would be provided other than minor repairs and maintenance of two houses and a boat dock, and a new composting comfort station. Additional visitor activity at Fern Lake under Alternative A could potentially cause increased soil erosion that could affect water quality. However, these potential effects would be offset by the addition of four new full-time employees to the park staff, implementation of best management practices for operation of the facilities at Fern Lake, continued education and outreach, and permanent preservation of the entire Fern Lake watershed.

Visitation is also expected to increase in other parts of the park as a result of past construction of facilities, including the Wilderness Road preservation project, construction of the Daniel Boone Visitor Information Center in 2004, restoration of the Hensley Settlement, renovation of the Civic Park, rehabilitation of the main visitor center, Wilderness Road Campground improvements, and construction at nearby state parks (Wilderness Road State Park, Pine Mountain State Park). Increased visitation in other areas of the park could also potentially cause increased erosion and associated effects on water quality and aquatic life. Increased visitation could also potentially adversely affect cultural resources in the park under Alternative A. These potential effects would be offset by the addition of four new (full-time equivalent) employees to the park staff, implementation of best management practices for operation and use of facilities, and continued education and outreach. The permanent protection of the entire Fern Lake watershed and continued management of the majority of the park (14,091 acres) as Recommended Wilderness will ensure long-term maintenance and enhancement of resources.

Alternative B

The effects of Alternative B on the long-term protection and enjoyment of park resources would be similar to Alternative A. Development of a few new limited facilities would support the National Park Service mission while avoiding adverse cumulative impacts to ecosystems or resources. Short-term degradation of local water quality during construction projects would largely be prevented by best management practices. Short-term localized soil erosion and degradation of plant communities at facility sites and along trail construction corridors would be offset by implementing best management practices for storm water management and by using sustainable design and building practices. In addition, these potential effects would be offset by the addition of four new full-time employees to the park staff, continued education and outreach, and management of the majority of the park as Recommended Wilderness Zone and Natural Zone.

Alternative C

Alternative C would have slightly higher potential to jeopardize the long-term productivity of the environment than that of Alternative A, since a variety and limited number of minor facilities would be constructed. However, expansion of the education, outreach, and partnering programs under Alternative C would contribute to the long-term protection and preservation of natural and cultural resources by increasing park stewardship. Increased coordination with local agencies, organizations, and other cooperative initiatives for resource use and management would further enhance resource

protection and preservation. Development of new facilities would support the NPS mission while avoiding, reducing, and minimizing adverse, direct and cumulative impacts to ecosystems or resources. Short-term localized soil erosion and degradation of plant communities at facility sites and along trail construction corridors would be offset by implementing best management practices for storm water management and by using sustainable design and building practices. In addition, these potential effects would be offset by the addition of 7.2 new (full-time equivalent) employees to the park staff, increased partnering, education and outreach programs, and management of the majority of the park as Recommended Wilderness Zone and Natural Zone.

Any Irreversible or Irretrievable Commitments of Resources that would be Involved if the Alternatives Were Implemented - National Environmental Policy Act (Sec. 102 (c) (v))

The National Environmental Policy Act and the NPS define irreversible effects as those effects that cannot be changed over the long term or are permanent (NPS 2006a). An effect to a resource is irreversible if the resource cannot be reclaimed, restored, or otherwise returned to its condition before the disturbance. An irretrievable commitment of resources refers to the effects to resources that, once gone, cannot be replaced.

Alternative A

There would potentially be irreversible or irretrievable commitments of non-renewable resources under Alternative A associated with use of energy and materials for limited facility construction and maintenance (a new composting comfort station at Fern Lake, and stabilization and maintenance of two buildings and a boat dock at Fern Lake) and for normal park operations. There would be some adverse effects on cultural and natural resources at Fern Lake associated with increased visitor use as well. These resources would be irretrievable once they were committed.

Alternatives B and C

Although the risks of resource impacts would be further reduced by management actions proposed under Alternatives B and C, instances of irreversible or irretrievable commitments of natural or cultural resources might occur. For example, removing artifacts or disturbing significant associated archeological resources would compromise the information potential of the site and result in an irreversible commitment of resources. Significant sites contain unique data that cannot often be replicated or recovered once lost or disturbed. Proposed management actions would contribute to resource protection and preservation and would be expected to minimize the occurrence of irreversible or irretrievable impacts. Limited amounts of nonrenewable energy and materials would be used for construction of a limited number of new facilities and park operations. These resources would be irretrievable once they were committed.

Any Adverse Impacts That Could Not Be Avoided If the Actions Were Implemented– National Environmental Policy Act (Section 101(c) (ii))

The National Park Service defines adverse impacts as those that cannot be fully mitigated or avoided. The majority of adverse effects may be mitigated or avoided. There are no major, adverse effects identified that are associated with implementation of the management actions proposed under any of the alternatives (A, B or C).

THIS PAGE INTENTIONALLY LEFT BLANK