



Rehabilitation of the Skyline Drive Overlooks

Shenandoah National Park

Environmental Assessment

June 2007

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PURPOSE AND NEED FOR ACTION

The National Park Service (NPS) proposes to rehabilitate 49 of the 69 historic overlooks located along Skyline Drive in Shenandoah National Park, located within Warren, Page, Rappahannock, Madison, Rockingham, Augusta, Greene, Albemarle, and Nelson Counties, Virginia. Skyline Drive was listed as a Historic District in the National Register of Historic Places on April 29, 1997. It encompasses the 105-mile ridgetop roadway from Front Royal to Rockfish Gap and its adjoining overlooks, wayside stations, picnic areas, and developed areas. It has more than 400 buildings, structures, and features that are listed in the National Register of Historic Places as contributory features of the Skyline Drive Historic District. The roadway includes the original 97 miles of Skyline Drive, built between 1931 and 1939, and the northernmost eight miles of the Blue Ridge Parkway, which was built between 1936 and 1937, administered by Shenandoah National Park from 1937-1961, and legislatively transferred to Shenandoah National Park in 1961. Significant features of the road include the road's curvilinear alignment and adjacent slopes, 69 scenic overlooks, numerous crossings of the Appalachian Trail and remnant mountain roads, six picnic grounds built by the Civilian Conservation Corps (CCC) between Dickey Ridge and South River, park headquarters at Luray, and remains of the CCC camp at Piney River, Pinnacles, and Big Meadows. Two additional developed areas, Skyland and Lewis Mountain, have been entered in the National Register. Figures 1 through 3 at the end of this chapter show the general locations of Skyline Drive and individual overlooks.

This environmental assessment (EA) analyzes the impacts that would result from the implementation of the two proposed action alternatives and the no action alternative. The first action alternative proposes to rehabilitate 49 of the 69 overlooks while preserving and rehabilitating the historic features of the overlooks. The second alternative would rehabilitate these 49 overlooks based on the Federal Highways Administration (FHWA) 2004 Final Design Scoping Report: Skyline Drive Central District for Shenandoah National Park (Engineering Study) recommendations. The no action alternative represents the current condition. The project area includes the areas within and immediately adjacent to the 49 overlooks proposed for rehabilitation. The majority of construction activities would occur within the original footprint of these overlooks, with the exception of approximately six non-historic/informal pull-offs that would be removed and revegetated.

This EA is intended to address the phased rehabilitation of the 49 overlooks as funding is made available into Fiscal Year (FY) 2015. Although the EA addresses the entire project, the park would review the document at the commencement of each phase to ensure that all project information is up to date and in compliance with the necessary regulations (e.g., Endangered Species Act).

This review would occur with the completion of detailed design drawings at each phase and would be addressed with the appropriate level of National Environmental Policy Act (NEPA) compliance.

This EA has been prepared in accordance with the NEPA of 1969 and implementing regulations, 40 CFR 1500-1508, and NPS Director's Order 12 and Handbook, *Conservation Planning, Environmental Impact Analysis, and Decision-making* (NPS 2001). Compliance with Section 106 of the National Historic Preservation Act of 1966 is occurring separate from the NEPA process.

PURPOSE OF THE ACTION

The purpose for taking action is to improve the overlooks found along Skyline Drive in a way that protects the resources and values of Shenandoah National Park and that:

- Preserves the historic character
- Improves public safety, and
- Enhances visitor enjoyment and historic interpretation of the park

NEED FOR THE ACTION

Improvements to 49 of the park's 69 overlooks are needed as a result of their deteriorating condition and to address non-historic modifications. These conditions include:

- Deterioration of historic stone guardwalls, retaining walls, and parking areas at overlooks has created public safety concerns and diminished overall visitor enjoyment.
- The prior elimination of some historic design features (i.e., wood guide rails, gravel walkways), and inappropriate later additions of some elements of the overlooks (i.e., rolled asphalt curbs and paved sidewalks) has diminished the overall historic character of the overlooks.

PURPOSE AND SIGNIFICANCE OF THE PARK

Shenandoah National Park is a vital part of America's national system of parks, monuments, battlefields, recreation areas, and other natural and cultural resources. Authorized by an Act of Congress in 1926, established in 1935, and dedicated in 1936, Shenandoah National Park is located along the crest of the Blue Ridge Mountains in Virginia. Containing approximately 197,000 acres, the park preserves an outstanding representation of the Blue Ridge/Central Appalachian biome and makes this valuable part of America's heritage available to approximately 1.3 million visitors each year for their experience, enjoyment, understanding, and appreciation.

ESTABLISHMENT

In 1926, Congress authorized the establishment of Shenandoah National Park. The Commonwealth of Virginia purchased nearly 280 square miles of land to be donated to the federal government. In dedicating the park in 1936, President Franklin D. Roosevelt initiated a novel experiment in allowing an overused area to return to a natural state. The CCC built recreational facilities, and in 1939 Skyline Drive was substantially completed; work on the road continued until 1951. Cropland and pastures soon became overgrown with shrubs, locusts, and pine; these in turn were replaced by oak, hickory and other trees that make up a mature deciduous forest. Now, more than 95 percent of the park is covered by forests with about 100 species of trees. The vegetative regeneration has been so complete that in 1976 Congress designated two-fifths of the park as wilderness.

PURPOSE

Based upon legislation and legislative history, Shenandoah National Park was established for the following purposes:

- To protect the natural and cultural resources of the northern Blue Ridge and immediate area,
- To have a "National Park" here, at this location, providing scenery, serving as a refuge and pleasuring ground, and including the developed visitor amenities traditionally found in other "National Parks," and
- To construct and maintain a "Skyline Drive" to provide outstanding views of the scenic and historic Shenandoah Valley and Piedmont of Virginia.

PARK STATEMENT OF SIGNIFICANCE

Park significance statements capture the essence of the park's importance to the nation's natural and cultural heritage. Understanding park significance helps managers to make decisions that preserve the resources and values necessary to the park's purpose. The following significance statements recognize the important features of Shenandoah National Park (NPS 2000a).

- This park provides a traditional "national park experience" in the east.
- This national park is nearby to large metropolitan populations, providing relatively good accessibility to millions of citizens.

- It provides recreation and “re-creation,” in the historic context of personal contemplative pleasure.
- Within the historic context of the time in which the park was established, the park represented a conscious change in human use of the land rather than the preservation of unimpaired resources.
- The park has become a sizeable “natural area” with large areas of designated wilderness and is an outstanding representation of the Blue Ridge/Central Appalachian biome.
- Skyline Drive and the associated developed areas at Simmons Gap, Lewis Mountain, Big Meadows, Skyland, Piney River, Pinnacles, Dickey Ridge, and park headquarters are listed on the National Register. This national significance is their association with the CCC, the Works Progress Administration, several hundred architectural or landscape architectural structures, and features that are highly representative of their type.
- Rapidan Camp, the summer retreat of Herbert and Lou Henry Hoover from 1929 to 1933, is a National Historic Landmark. It served as the summer “White House” during the Hoover presidency, was the site of many national and international policy meetings, and retains significant rustic architectural and landscape architectural structures and features.
- The Appalachian Trail is the backbone of the park’s trail system, includes fine examples of early trail construction techniques, and is the longest segment of the trail in a national park.

PARK MISSION STATEMENT

Park resources are managed to achieve the following desired future conditions at Shenandoah National Park:

- The ecological integrity of this portion of the Blue Ridge/Central Appalachian biome is protected, maintained, and restored as appropriate.
- Cultural landscapes, other significant cultural resources, and associated values are protected, restored as appropriate, and maintained in good condition and managed within their cultural context.
- The views of the Shenandoah Valley and Piedmont Plain, as seen from the park, are scenic and rural in character, maintained in partnership with and integrating the needs of the surrounding communities.
- Visitors safely enjoy and are satisfied with the availability, accessibility, diversity, and quality of park facilities, services, and appropriate recreational and “re-creational” opportunities.
- The stories of the area and the development of the park are available; visitors and the general public learn the purposes and significance of the park.

PROJECT BACKGROUND AND RELATED PLANS

Skyline Drive and its associated overlooks are on the National Register of Historic Places. The Drive and the overlooks were constructed by contractors and the CCC beginning 75 years ago and were intended to provide outstanding views of the scenic and historic Shenandoah Valley and Piedmont of Virginia. Without the overlooks, Skyline Drive would not have the same attraction to the public.

At the request of the NPS Northeast Regional Office, the Eastern Federal Lands Highway Division (EFLHD) of the FHWA prepared an engineering study (FHWA 2001) to evaluate the needs and priorities for rehabilitation and reconstruction of selected roads within the park, including Skyline Drive and associated overlooks. Field reviews of the park were conducted between April and July 2000. Park staff provided guidance in identifying deficiencies and stayed involved in the initial study development process. In addition, resources such as traffic counts, accident history, the Roadside Barrier Placement Guide (NPS 1997a), structure inspection reports, and previous studies were utilized in determining these recommendations. The study looked at more than 157 separate roadway segments, parking areas, and facility access areas, with most requiring some degree of improvement. The main focus of the study was

to identify the road and parking facilities, that, if not repaired, rehabilitated, or maintained would otherwise deteriorate to the point where costly replacement becomes necessary (FHWA 2001).

Because of a lack of funds, many of the overlooks have not been properly maintained since their original construction. The *Engineering Study for Roads and Bridges in Shenandoah National Park*, prepared by the FHWA in 2001, rated the overlooks from fair to poor condition and recommended rehabilitation within five years. Their findings included, that most pavements require overlay with isolated spot repairs, most overlook stone walls require removal/rebuilding, with many existing walls not at the standard height of 27 inches. Some walls appear to be above grade on the overlook side, but are in fact retaining walls for fill slopes on the outer side. Further, some walls have slid or shifted down slope and may require more substantial footings and/or slight relocations away from the slope (FHWA 2001). Many of the recommendations provided in this report have been incorporated into the proposed alternatives that are described in detail in the following chapter.

NATIONAL PARK SERVICE PLANS, POLICIES, AND ACTIONS

Created and approved in 1983, the *Shenandoah National Park General Management/Development Concept Plan* guides the overall management and use of park resources. The general management portion of the plan indicates overall unified programs for park preservation, interpretation of the park's natural and cultural resources, visitor use, development, and administration. The development concept portion refines proposals for the developed areas and discusses the spectrum of existing and new facilities that will allow opportunities for recreation and re-creation to continue for future generations.

The *Park Road Standards* document sets forth guidelines for the following: vertical and horizontal alignment, sight distance, intersections, number of lanes, cross-section, recreation areas, surface crown, roadside slopes and drainage, guardrail/guides, and curbs. In addition, guidelines for rehabilitation, resurfacing, and reconstruction (3-R) projects address traffic volume, design speed, pavement and shoulder widths, grades, curvature, sight distance, bridges, and historic structures. While there would be no changes in the current design or function of Skyline Drive, *Park Road Standards* will provide guidance in maintaining the historically significant elements of the overlooks during this rehabilitation project.

Director's Order #28 calls for the NPS to protect and manage cultural resources in its custody through effective research, planning, and stewardship and in accordance with the policies and principles contained in the NPS Management Policies (NPS 2006). This order also directs the NPS to comply with the substantive and procedural requirements described in the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation. The accompanying handbook to this order addressed standards and requirements for research, planning, and stewardship of cultural resources as well as the management of archeological resources, cultural landscapes, historic and prehistoric structures, museum objects, and ethnographic resources. Additionally, the NPS will comply with the 1995 Servicewide Programmatic Agreement with the Advisory Council on Historic Preservation and the National Conference of State Historic Preservation Officers.

SCOPING

In August 2004, design scoping was conducted by the NPS and the EFLHD of the FHWA, which resulted in the development of the report titled *Design Scoping Report: Skyline Drive Central District for Shenandoah National Park*. The report stated that the main purpose of this project was to restore and rehabilitate the overlooks which have fallen into disrepair and/or altered over the years from their historic configurations.

In November 2004, an internal scoping meeting was held at the park regarding the rehabilitation of Skyline Drive and overlooks. The participants of this meeting included NPS staff from both Shenandoah National Park and the Denver Service Center, and representatives from the EFLHD of the FHWA. The meeting included a summary of FHWA recommendations outlined in the final *Design Scoping Report*:

Skyline Drive Central District for Shenandoah National Park (FHWA 2004) and discussions on how rehabilitation along Skyline Drive and at the overlooks should occur in order to meet the park's desired outcomes for the project. From this information and discussion, two feasible rehabilitation alternatives were developed that called for the rehabilitation of Skyline Drive and 49 overlooks.

On March 8, 2005, the park sent scoping letters to park neighbors and organizations, and issued press releases in 18 local and regional newspaper describing the proposed rehabilitation of Skyline Drive and 49 of its 69 overlooks and to solicit public comments on this proposed action. No comments were received during this 30-day comment period.

In the fall of 2006, the NPS decided to implement a pavement management approach for Skyline Drive rather than a rehabilitation of the road due to funding limitations. Pavement management involves making spot repairs of the road base, the road surface, existing drainage, and shoulders. The rehabilitation of Skyline Drive was therefore dropped from the scope of the current project, which is now limited to the rehabilitation of selected overlooks along Skyline Drive. It was determined that the actions associated with the Skyline Drive pavement management would result in no measurable environmental effects and have therefore been categorically excluded from further National Environmental Policy Act analysis under Categorical Exclusion: DO12 3.4 C (9) – *Repair, resurfacing, striping, installation of traffic control devices, and repair/replacement of guardrails, culverts, signs, and other minor existing features on existing roads when no potential for environmental impact exists.*

ISSUES

Issues describe problems or concerns associated with current impacts from environmental conditions or current operations, as well as problems that may arise from the implementation of any of the alternatives. Potential issues associated with the rehabilitation the 49 overlooks were identified by the park staff, and input from other agencies consulted.

The primary concern of the park, as identified during the internal scoping meeting, is to allow for minimal disturbance to the cultural and historic landscape and sensitive species, while enhancing visitor experience, providing safe and efficient accommodation of park visitors, and serving essential management access needs. Other identified issues and concerns are listed below.

Natural Resources

- Rehabilitation of the 49 overlooks would impact soils.
- Within the general vicinity of 5 to 10 overlooks along Skyline Drive there are small populations of state sensitive and state rare plant populations (Ludwig et al., 1993). There is the possibility that construction activities could adversely impact these populations if not adequately protected. However, these areas are well known to park staff and, prior to any construction, would be flagged in the field and the construction contractor would be directed to avoid these areas (appendix A).
- Habitat for the Shenandoah salamander (*Plethodon shenandoah*), a federally listed endangered species, occurs only within Shenandoah National Park and, in some instances, in close vicinity of Skyline Drive. The Shenandoah salamander lives in moist, forested talus areas. Since the areas near the overlooks have been cleared of trees to a distance of 50 to 200 yards to maintain historic vistas and are now sun-drenched grassy areas, it is unlikely that the Shenandoah salamander would occur in these areas because it is unsuitable habitat. However, measures would be taken to eliminate any impacts to this species during the rehabilitation activities through surveys, flagging of known habitat, and familiarizing construction staff with the salamander's appearance and the need to stop construction if encountered at the site (appendix A).

Cultural Resources

- Skyline Drive in its entirety, is designated a National Historic District. There could be beneficial impacts as the overlooks are repaired and restored to be historically accurate.
- Inappropriate rehabilitation could adversely affect those qualities that make the Skyline Drive historically significant.

Visitor Use and Experience

- Potential adverse impacts to visitor experience could include the continued degradation of the overlooks, short traffic delays, closed overlooks, noise impacts, and impacts to those using the Appalachian Trail.
- Temporary trail diversions may be necessary along the Appalachian Trail at Stony Man. Hikers could use the road rather than the trail; however, safety issues could result.
- Beneficial impacts to visitor use and experience would occur as the overlooks are rehabilitated to an improved, more sustainable condition for their intended uses.

Health and Safety

- The continued degradation of the overlook guardwalls, retaining walls, curbs, drainage structures and asphalt surfaces could create unsafe conditions for park staff and visitors. Repair/rehabilitation of these structures would restore them to their original functions.
- The replacement of rolled curb sidewalks with historically accurate sidewalks at the overlooks would improve accessibility for those visitors with disabilities.
- The restoration of guardrails at selected overlooks would improve safety by directing visitors away from potential hazards.
- If it were to become necessary to divert hikers off park trails and on to Skyline Drive as a result of construction activities associated with the rehabilitation of the overlooks, there could be impacts to health and safety as hikers and automobiles would temporarily share the same space.

IMPACT TOPICS

The following impact topics are discussed in the “Affected Environment” chapter and analyzed in the “Environmental Consequences” chapter. These topics are resources of concern that could be beneficially or adversely affected by the actions proposed under each alternative and are developed to ensure that the alternatives are evaluated and compared based on the most relevant topics. These impact topics were identified based on the following: issues raised during scoping, federal laws, regulations, executive orders, NPS 2006 *Management Policies*, and NPS knowledge of limited or easily impacted resources. A brief rationale for the selection of each impact topic is given below, as well as the rationale for dismissing specific topics from further consideration.

Natural Resources

Impacts to Soils – The rehabilitation of the overlooks could create earth disturbance that could result in soil erosion and loss of topsoil; therefore, this impact topic was carried forward for further analysis in this EA.

Impacts to Threatened, Endangered or Special Concern Species – The Shenandoah salamander (*Plethodon shenandoah*) is designated as federally endangered, and occurs solely within Shenandoah National Park and in the general vicinity of Skyline Drive. The federally endangered Indiana bat (*Myotis sodalis*) has also been documented within the park, but no known habitat occurs within the vicinity of the project areas (appendix A). In addition, there are small populations of state sensitive and state rare plant populations within the general vicinity of 5 to 10 overlooks along Skyline Drive (Ludwig et al.,

1993). Overlook rehabilitation construction activities in both action alternatives could temporarily impact its habitat; therefore, this impact topic was carried forward for further analysis in this EA.

Cultural Resources

Impacts to the Cultural Landscape – Skyline Drive is in itself designated as a cultural landscape and any changes to the layout or design of road or features associated with the road, such as overlooks, could impact this landscape; therefore, this impact topic was carried forward for further analysis in this EA.

Visitor Use and Experience

Impacts to Visitors – Shenandoah National Park provides access to a variety of recreational activities including scenic driving, camping, and hiking, among others. Activities associated with the rehabilitation of the overlooks associated with Skyline Drive could affect or change the character of the road and alter visitor experiences. Access to recreational activities could also be temporarily disrupted during the rehabilitation process; therefore, this impact topic was carried forward for further analysis in this EA.

Health and Safety

Impacts to Visitor Safety – The current condition of the overlooks range from good to poor with many of the historic stone guardwalls, retaining walls, and parking areas showing signs of deterioration. The rehabilitation of the overlooks would address these safety deficiencies. In addition, if it were to become necessary to divert hikers off park trails and on to Skyline Drive as a result of construction activities associated with the rehabilitation of the overlooks, impacts to visitor health and safety could occur as a result of conflicts between hikers and cars. For these reasons, this impact topic was carried forward for further analysis in this EA.

Park Management and Operations

Impacts to Park Operations – The rehabilitation of the park's overlooks could impact the amount of time and type of maintenance required to maintain the overlooks, and other recreational facilities located along Skyline Drive; therefore, this impact topic was carried forward for further analysis in this EA.

IMPACT TOPICS ELIMINATED (OR DISMISSED) FROM FURTHER ANALYSIS AND CONSIDERATION

The following impact topics were eliminated from further analysis in this EA. A brief rationale for dismissal is provided for each topic. With mitigation, potential impacts to these resources would be negligible, and localized.

Vegetation

Overlook rehabilitation would disturb currently paved or graveled surface areas that support little to no vegetation. Any vegetated area disturbed during construction would be revegetated prior to project completion. Implementing either action alternative would be expected to result in localized negligible adverse impacts on vegetation throughout project construction and during revegetation and habitat restoration activities following construction; therefore, this impact topic was dismissed from further analysis in this EA.

Wildlife and Wildlife Habitat

Construction activities associated with the rehabilitation of the overlooks associated with Skyline Drive would disturb currently paved or graveled surface areas that support little to no vegetation and are of low habitat value to wildlife. In areas adjacent to the overlooks, wildlife has been habituated to human activity through years of close association with the road and attendant human activity, vehicles, and noise reducing the overall value of this habitat because of the road's proximity. In addition, almost all rehabilitation and construction areas have been generally disturbed to some degree by impacts from vehicles, paved and graveled surfaces, and traffic. These disturbances have further degraded any habitat value to wildlife.

Some wildlife that does frequent the road corridor, particularly small mammals and reptiles, would be temporarily displaced during construction. Some individuals would be forced to relocate outside the construction limits and would be susceptible to increased levels of predation or competitive stress. This displacement could result in a slight population depression adjacent to the corridor, but following project completion and successful revegetation efforts, wildlife would again reoccupy restored portions of the project area. It is likely that certain larger species would avoid the road corridor altogether during construction. Implementing either of the action alternatives would be expected to result in localized negligible adverse impacts on wildlife throughout the duration of the project and revegetation and habitat rehabilitation activities. Due to these limited impacts, this impact topic was dismissed from further analysis in this EA.

Prime Farmland

Prime farmland, as defined by the U.S. Department of Agriculture (USDA), is the land that is best suited to food, feed, forage, fiber, and oilseed crops. It may be cultivated land, pasture, woodland, or other land, but it is not urban and built-up land or water areas. Prime farmland is protected under the Farmland Protection Policy Act of 1981 to minimize the extent to which federal programs contribute to the unnecessary or irreversible conversion of farmland to nonagricultural uses. There are no known prime farmland soils occurring in the vicinity of Skyline Drive or its overlooks; therefore, this impact topic was dismissed from further analysis in this EA.

Water Quality

The 1972 Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977, is a national policy to restore and maintain the chemical, physical, and biological integrity of the nation's waters and to enhance the quality of water resources and to prevent, control, and abate water pollution. The NPS *2006 Management Policies* provides direction for the preservation, use, and quality of water originating, flowing through, or adjacent to park boundaries. The NPS seeks to restore, maintain, and enhance the quality of all surface and groundwaters within the parks consistent with the 1972 Federal Water Pollution Control Act, as amended, and other applicable federal, state, and local laws and regulations.

Should either of the action alternatives be selected, adverse impacts to local surface and subsurface water resources would be negligible. Sediment traps, erosion checks, and/or filters would be constructed preceding or following all culvert drains (if such drains are required) and in all other ditches before the water (runoff) leaves the project construction limits. Although the project would require some cut and fill actions, silt screens or other methods of erosion and sedimentation control would diminish any impact to surface and subsurface water resources. Surface rehabilitation and revegetation of disturbed land following construction would reduce soil erosion.

Negligible impacts to stream flows would also be expected under either of the action alternatives. If water were extracted from a nearby stream for construction purposes, it would require NPS concurrence and would occur in a manner that would have negligible impacts on the total volume of water in the stream and continued stream flow. Under either action alternative, it is anticipated that several drainage systems at some of the overlooks would require rehabilitation. Any new or replacement inlets would be similar in design to the existing structures and the existing drop inlets would be cleaned and repaired as needed. No increases in stormwater runoff are anticipated. These improvements would better manage stormwater runoff from the overlooks, which in turn would decrease the potential for stormwater runoff to cause erosion, allowing more stormwater to percolate into the groundwater, decreasing stream flow fluctuations following rain events. However, the scope of the proposed drainage improvements would not be sizeable enough to cause a noticeable difference in stream flow.

Current drainage deficiencies would only be addressed as funding allows under the no action alternative; however, any drainage problem with the potential to cause significant damage would be addressed accordingly. Minor drainage deficiencies not immediately addressed could cause some localized erosion and contribute sediment to park streams as stormwater flows quickly down the hillsides due to the steep gradients. Some fluctuations of stream flows could also result following a rainstorm. However, these

water quality and stream flow impacts would be negligible because they would be localized and would be addressed as funding allows or as the need arises.

With mitigation, implementation of either of the proposed action alternatives would only have negligible adverse impacts to water quality and stream flows throughout construction and during post-construction revegetation activities; therefore, this impact topic was dismissed from further analysis in this EA.

Wetlands

Wetlands include areas inundated or saturated by surface or groundwater for a sufficient length of time during the growing season to develop and support characteristic soils and vegetation. The NPS classifies wetlands based on the U.S. Fish and Wildlife Service (USFWS) *Classification of Wetlands and Deepwater Habitats of the United States*, also known as the Cowardin classification system (Cowardin et al. 1979). Based on this classification system, a wetland must have one or more of the following attributes:

- The habitat at least periodically supports predominately hydrophytic vegetation (wetland vegetation);
- The substrate is predominately undrained hydric soil; or
- The substrate is non-soil and saturated with water, or covered by shallow water at some time during the growing season.

The park has several known wetland areas beyond stream banks, with Big Meadows being the most visible and largest wetland in the general proximity of Skyline Drive, which lies roughly 500 feet from Skyline Drive. Impacts to wetlands are not expected under either action alternative because no wetlands are located within close proximity of any of the overlooks, all construction activities associated with both action alternatives would occur mostly within the current footprint of the overlooks, and no increases in the total amount of stormwater runoff from the rehabilitated overlooks are expected. In addition, impacts to wetlands under the no action alternative are not expected because there are currently no overlook-related drainage problems causing damage to the park's wetlands. As a result, this impact topic was dismissed from further analysis in this EA.

Floodplains

Executive Orders 11988 (Floodplain Management) requires an examination of impacts to floodplains and the potential risk involved in placing facilities within floodplains. The NPS 2006 *Management Policies*, Section 4.6.4, Floodplains, the 1993 NPS Floodplain Management Guidelines, DO-77-2, and the 1983 GMP provide guidelines on developments proposed in floodplains. All of the overlooks along Skyline Drive are located along the crest of the Blue Ridge Mountains in Shenandoah National Park, and are not located within any regulatory floodplain, as defined by NPS Guidelines. Most of the streams and stream segments in the park are high gradient and peak flows from precipitation events and snow and ice melt pass downstream quickly. Because both the action alternatives and no action alternative would have no long- or short-term adverse impacts associated with the occupancy and modification of floodplains, and would avoid direct or indirect support of floodplain development, this impact topic was dismissed from further analysis in this EA.

Air Quality

The 1963 Clean Air Act, as amended (42 USC 7401 et seq.), requires federal land managers to protect park air quality. Shenandoah National Park was designated Class I under the 1963 Clean Air Act, as amended. Class I areas must not exceed the maximum allowable increment over baseline concentrations of sulfur dioxide and particulate matter as specified in Section 163 of the 1963 Clean Air Act. Further, the 1963 Clean Air Act provides that the federal land manager must have an affirmative responsibility to protect the park's air quality related values (including visibility, plants, animals, soils, water quality, cultural and historic resources and objects, and visitor health) from adverse air pollution impacts.

Should either of the action alternatives be selected, local air quality would be temporarily affected by dust and vehicle emissions. Hauling material and operating equipment would result in increased vehicle exhaust and emissions during the construction period. Hydrocarbons, nitrogen oxide, and sulfur dioxide emissions would be rapidly dissipated by air drainage since air stagnation is uncommon at the project site. Fugitive dust plumes from construction equipment would occasionally increase airborne particulates in the area near the project site; however, these loading rates would be of short duration and of negligible to minor consequence.

Should the no action alternative be selected there would be no impacts to air quality as this alternative represents the park's current condition. With the action alternatives, temporary increases in air pollution would occur during construction, primarily from operation of construction equipment, but also from queuing of visitor's vehicles if stopped temporarily during the construction period.

Overall, there would be a slight and temporary degradation of local air quality due to dust generated from road reconstruction activities and emissions from construction equipment and visitor vehicles. These effects would be localized and negligible to minor, lasting only as long as road reconstruction activities occurred. Because the park's Class I air quality would not be affected by the proposal, this impact topic was dismissed from further analysis in this EA.

Soundscapes

Park facilities, including recreational facilities and administrative buildings, along Skyline Drive were identified and their approximate distance to the roadway was determined. It was assumed that traffic noise would average 70 on the A-weighted decibel scale (dBA), 50 feet from the pavement edge, as determined by the Federal Interagency Committee on Noise (FICON 1992). Using this standard, the approximate noise level at each park facility was determined and compared to the NPS regulatory limit of 82 dBA, as set forth in Director's Order 47, *Soundscape Preservation and Noise Management* (NPS 2000b). In all instances, under all alternatives, sound levels were estimated below the NPS regulatory limit, and thus would have only negligible impacts. Furthermore, it was assumed that construction activities under any alternative would be short-term and only occur during the construction period for the roadway. These activities would be confined to normal working hours and would comply with all noise regulations, resulting in negligible impacts during construction. Since only negligible impacts would occur during operation and construction under all alternatives, this impact topic was dismissed from further analysis in this EA.

Traffic and Transportation

Skyline Drive is used almost solely by park visitors accessing Shenandoah National Park and is not used for local commuter traffic. Under either action alternative only small sections of the road near the overlooks would be affected and at least one lane would always remain open to travel during construction. Following completion of construction, the posted speed limit of the road would remain 35 miles per hour (mph). Because traffic impacts along Skyline Drive would be negligible both during and after construction under any of the proposed alternatives, this impact topic was dismissed from further analysis in this EA.

Land Use

The rehabilitation of the overlooks associated with Skyline Drive would not have impacts to occupancy, property values, ownership, or any type of land use; therefore, this impact topic was dismissed from further analysis in this EA.

Unique Ecosystems, Biosphere Reserves, World Heritage Sites

There are no known biosphere reserves, World Heritage sites, or unique ecosystems listed in Shenandoah National Park; therefore, this impact topic was dismissed from further analysis in this EA.

Archeological Resources

Since all the overlooks are constructed on cut or fill slopes and the majority of the work associated with rehabilitation of the overlooks under the two action alternatives would be conducted within the original overlook footprint, the likelihood of *in situ* archaeological resources is minimal. Although archeological testing at the Limberlost parking area discovered potentially significant resources, the reconfiguration of the parking area would be designed to avoid affecting these resources and, thus, no impacts would be anticipated. Previously undiscovered archeological sites would most likely not be affected because archeological testing of two overlooks, carried out in 2004, showed that no sites dating to before the construction of Skyline Drive are likely to be present within the overlooks (Nash and Ledford 2004). In addition, staging areas for the two action alternatives would be limited to areas known to be clear of archeological sites. The current operation of Skyline Drive and its associated overlooks represented by the no action alternative do not adversely impact archeological resources of the park; therefore, this impact topic was dismissed from further analysis in this EA.

If an archeological resource were found during construction, work in the area of the find would be stopped until the find was documented, its significance assessed, and appropriate mitigation strategies developed in consultation with the State Historic Preservation Officer. In addition, monitoring would be conducted in the Limberlost parking area during all ground-disturbing construction activity to ensure avoidance of any potentially significant resources.

Ethnographic Resources

There are only two possible ethnographic groups found within Shenandoah National Park: Native Americans and mountain residents. Both of these groups predate the creation of Skyline Drive and were not in residence after its creation. There is no evidence that Native American groups ever had permanent residence within the current boundaries of the park. In addition, mountain residents do not represent a defined cohesive ethnographic community (Engle 2007). As a result, there are no ethnographic resources within the park that would be affected by the no action alternative or either of the action alternatives; therefore, this impact topic was dismissed from further analysis in this EA.

Museum Collections

Since the majority of the rehabilitation of the overlooks proposed under the two action alternatives would be conducted within the original overlook footprint, there would be no impacts to any historic structures or buildings where museum collections could be kept. Implementation of any of the alternatives is not expected to affect any historic structures or buildings where museum collections could be kept in the vicinity of Skyline Drive; therefore, this impact topic was dismissed from further analysis in this EA.

Historic Structures

While the road itself and associated road-related structures are considered historic structures, impacts are being addressed under the Cultural Landscapes impact topic. Because any potential impacts to historic structures are addressed as part of the “Cultural Landscape” analysis, this impact topic was dismissed from further analysis in this EA.

Environmental Justice

On February 11, 1994, President Clinton issued Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.” This order directs agencies to address environmental and human health conditions in minority and low-income communities so as to avoid the disproportionate placement of any adverse effects from federal policies and actions on these populations. Local residents may include low-income populations, but these populations would not be particularly or disproportionately affected by the rehabilitation of 49 of the park’s overlooks; therefore, this impact topic was dismissed from further analysis in this EA.

Socioeconomic Resources

NEPA requires an analysis of impacts to the human environment, which includes economic, social, and demographic elements in the affected area. The current conditions at Shenandoah National Park, as represented by the no action alternative, would not have any impacts to the socioeconomic resources of the area. Activities associated with either of the action alternatives may bring a short-term need for additional personnel in the park, but this addition would be minimal and would not affect the neighboring community's overall population, income, and employment base. Therefore, this impact topic was dismissed as an impact topic in this EA.

FIGURE 1. PROJECT MAP (NORTHERN PORTION)

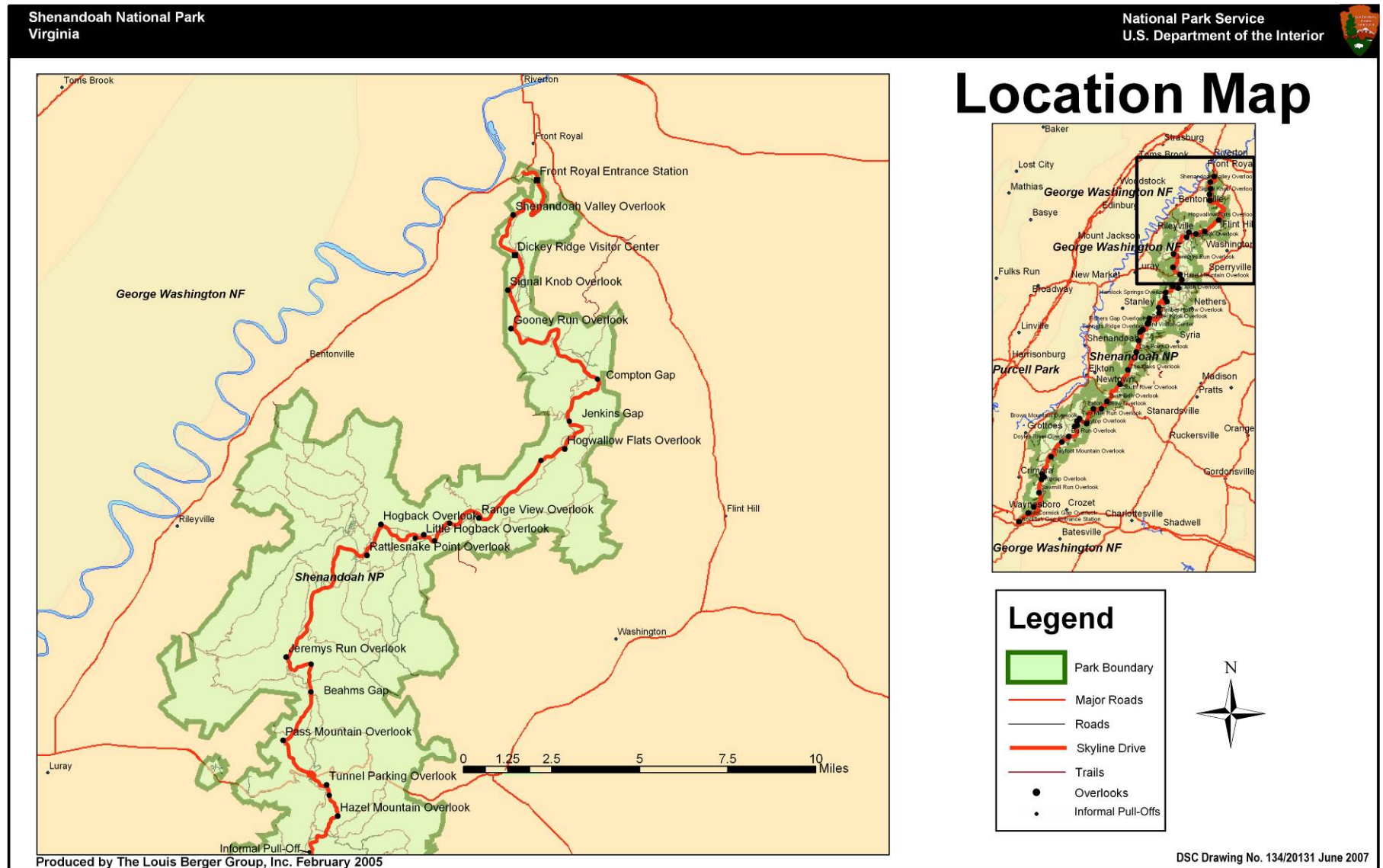


FIGURE 2. PROJECT MAP (CENTRAL PORTION)

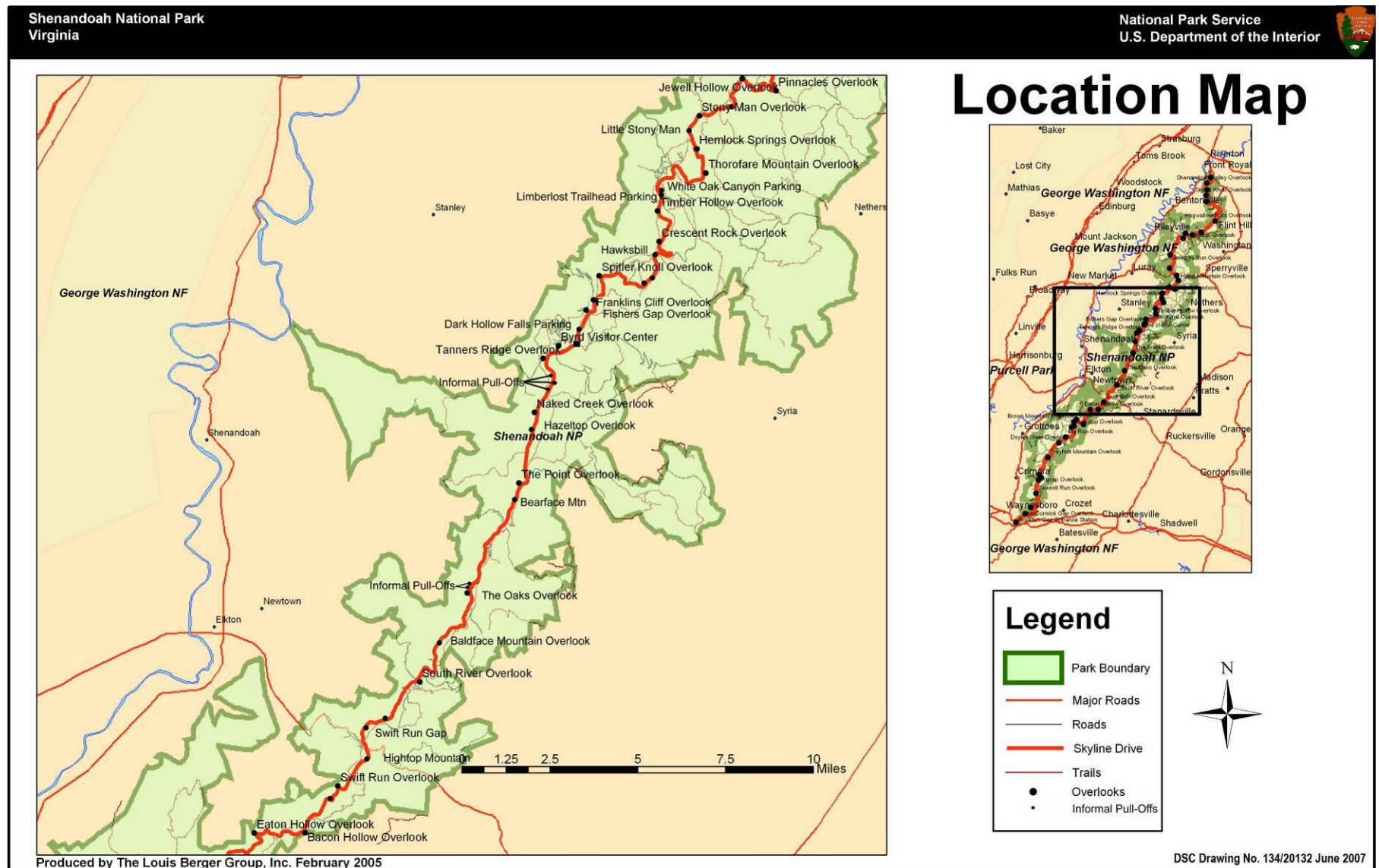
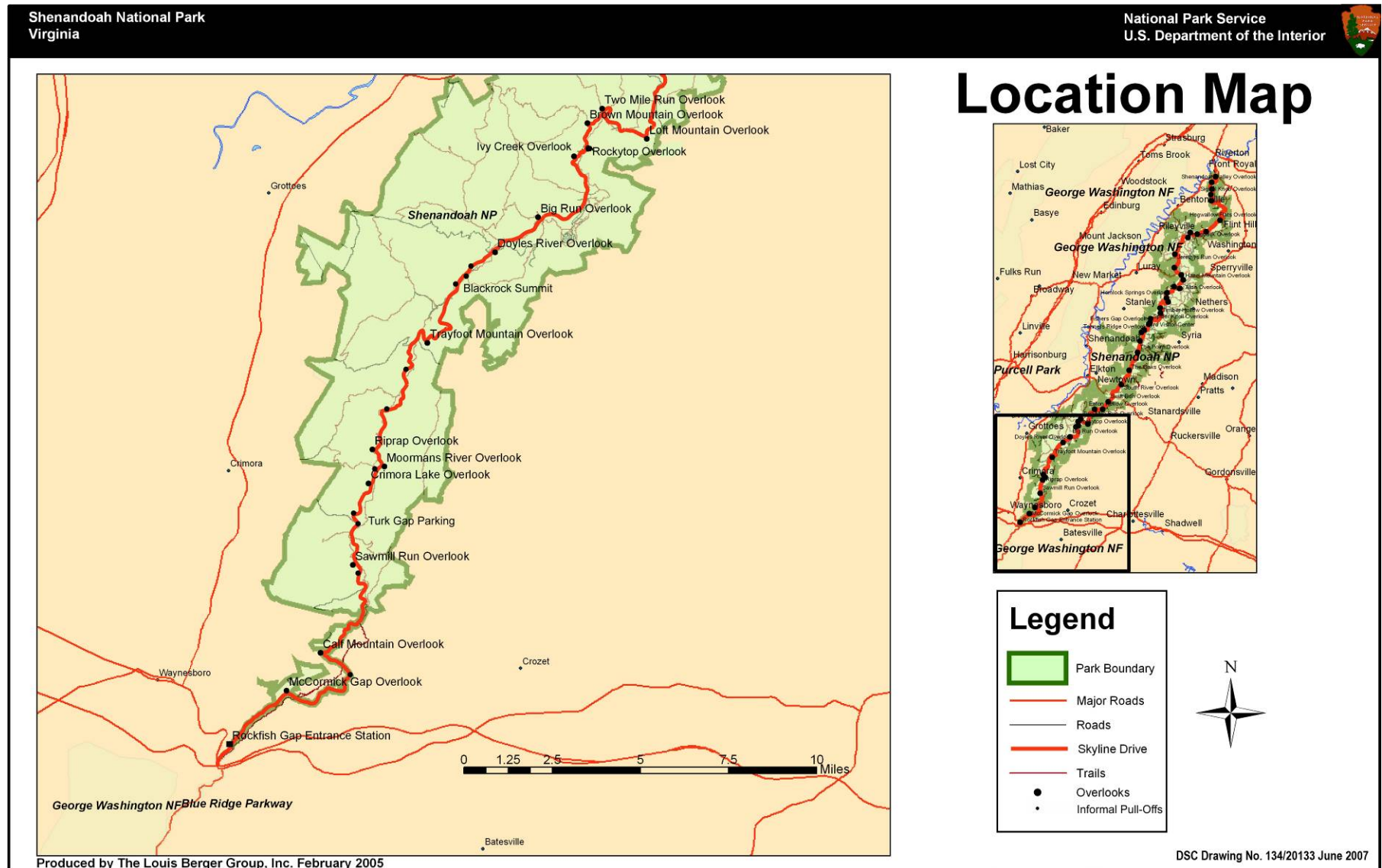


FIGURE 3. PROJECT MAP (SOUTHERN PORTION)



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ALTERNATIVES

NEPA requires that federal agencies explore a range of reasonable alternatives. The alternatives under consideration must include the “no action” alternative as prescribed by 40 CFR 1502.14. Project alternatives may originate from the proponent agency, local government officials, or members of the public, at public meetings, or during the early stages of project development. Alternatives may also be developed in response to comments from coordinating or cooperating agencies. The alternatives analyzed in this document, in accordance with NEPA, are the result of design scoping, internal scoping, and public scoping.

The NPS explored and objectively evaluated a range of alternatives in this EA. Three alternatives were carried forward for analysis:

- Alternative A – No Action Alternative.
- Alternative B – Rehabilitation with Preservation and Rehabilitation of Historic Features.
- Alternative C – Rehabilitation Based on Engineering Study Recommendations.

ALTERNATIVE A – NO ACTION ALTERNATIVE

The no action alternative serves as the baseline by which to compare all other alternatives. Under the no action alternative, the park would continue to implement selected repairs to the overlooks as funding allows. However, the overlooks along Skyline Drive would continue to deteriorate. Should the no action alternative be selected, the NPS would respond to future needs and conditions without major actions or changes in the present course. Repair and/or maintenance would be conducted to the overlooks where there is specific need for critical and emergency repairs. Regular maintenance would be carried out as funding allows. Frequent patching of cracks and potholes in the paved surfaces of the overlooks and repairs to the remaining historic stone guardwalls would continue as needed to maintain them in a safe condition for public use. Additional improvements at any of the park’s overlooks would only be conducted if funding became available, unless they posed an immediate threat to public safety. The overall condition of the stone guardwalls and retaining walls would continue to degrade. All non-historic pull-offs would remain.

ACTION ALTERNATIVES

Alternatives A and B address the rehabilitation of 49 of the 69 historic overlooks found along Skyline Drive. Rehabilitation of 49 of the park’s historic overlooks varies between the two action alternatives, but generally includes the following work:

- Reconstruction and stabilization of fill slopes constructed to support the overlooks, where necessary,
- Rehabilitation of failing stone guardwalls at the overlooks to their original 22 inch height,
- Reconstruction or rehabilitation of stone curbing,
- Reconstruction or rehabilitation of walkways,
- Replacement or rehabilitation of retaining walls, and
- Milling and overlaying existing pavement within the parking areas with some spot reconstruction of the road aggregate base course.

While the proposed actions calls for the rehabilitation of 49 overlooks along Skyline Drive, because of future funding constraints, a schedule for overlook rehabilitation work cannot yet be developed beyond the first five scheduled overlooks. In addition, because the physical condition of the overlooks continues to degrade, future rehabilitation activities needed at each specific overlooks cannot be fully determined at this time.

To properly assess the entire spectrum of impacts that could occur from the proposed rehabilitation of 49 overlooks, rehabilitation efforts were broken down into three categories, based on the level of effort that would be required for each particular overlook. These categories include: total rehabilitation, partial rehabilitation, and spot repair. These categories were developed as a means to more accurately analyze the impacts that could occur, based on the condition of the overlook at the time of available funding. Table 1 provides the rehabilitation activities proposed under each category. While not every rehabilitation activity listed within each category would necessarily be employed at every overlook, utilizing specific rehabilitation categories provides a basis for analysis that looks at the maximum impact that would occur for each category.

ELEMENTS COMMON TO BOTH ACTION ALTERNATIVES

- Remove approximately six non-historic/informal pull-offs by removing any hard surface material present, grading and scarifying the soil, and seeding the area to return it to its landscaped condition.
- Revegetate with stabilized turf one non-historic overlook at Milepost 58.5.
- Repave and reconfigure parking area at Dark Hollow Overlook and Limberlost Trailhead (see appendix B).
- Those overlooks requiring total rehabilitation could be closed for up to two years, while those overlooks requiring partial reconstruction could be closed for up to one year, and maybe longer depending upon the extent of rehabilitation.
- No more than one or two overlooks would be closed at any one time.

ALTERNATIVE B – REHABILITATION WITH PRESERVATION AND REHABILITATION OF HISTORIC FEATURES (PREFERRED ALTERNATIVE)

Alternative B would entail rehabilitation of 49 of 69 overlooks found along Skyline Drive. An important aspect of the rehabilitation project would be the preservation of the historic character of the overlooks by retaining and, where necessary, repairing or replacing significant character-defining features such as stone curbing, walkways, and stone retaining walls. It is anticipated that drainage systems at some of the overlooks would require rehabilitation. Any new or replacement inlets would be similar in design to the existing structures and new headwalls would be designed to be compatible with the historic character of the road. Existing drop inlets would be cleaned and repaired as needed.

The level of stabilization, rehabilitation, and/or construction necessary at each of the 49 overlooks varies depending upon current conditions. Rehabilitation of the overlooks would involve a range of repairs, as outlined in Table 1 that would be employed to varying degrees at all 49 overlooks. The proposed repairs under this alternative were designed to address the deficiencies at each of the 49 overlooks, while maintaining historic accuracy.

Under alternative B, rehabilitation of 49 of the 69 overlooks would occur as funding becomes available. Those overlooks in need of total reconstruction would be addressed first in order to ensure visitor and park staff safety needs are met. The remaining overlooks that require partial reconstruction or spot repair would be addressed as funding permits. Alternative B would bring these overlooks into an improved, more sustainable condition for their intended uses while preserving their historic character.

ALTERNATIVE C – REHABILITATION BASED ON ENGINEERING STUDY RECOMMENDATIONS

Alternative C would allow for the rehabilitation of 49 of 69 overlooks found along Skyline Drive based on engineering study recommendations (FHWA 2001). Rehabilitation of the overlooks would involve a range of repair prototypes that would be employed to varying degrees at all 49 overlooks. However, the proposed repairs under this alternative addresses deficiencies at each of the 49 overlooks based on engineering study recommendations, and does not account for historic design (see Table 1). It is

anticipated that drainage systems at some of the overlooks would require rehabilitation as well. Existing drop inlets would be cleaned and repaired as needed.

Alternative C would bring the park's overlooks into good condition and improve public safety, one of the purposes for taking action. However, in this alternative, safety and maintenance considerations are a higher priority than the historic character of the road and overlooks, visitor enjoyment, and historical interpretation of the park.

TABLE 1. OVERLOOK REHABILITATION UNDER THE ACTION ALTERNATIVES

Action	Alternative B – Rehabilitation with Preservation and Rehabilitation of Historic Features	Alternative C – Rehabilitation Based on Engineering Study Recommendations
TOTAL REHABILITATION		
Fill Slopes	Reconstruct failing fill slope and retaining wall, from the wall base.	Reconstruct failing fill slope and retaining wall, from the wall base.
Guardwalls	Total to partial reconstruction of historic stone guardwalls at the overlooks with the original stone or historically accurate materials to original 22-inch height.	Total to partial reconstruction of historic stone guardwalls with concrete core stone walls to original 22-inch height.
Stone Curbs	Reset stone curbing to new grades, and replace missing and/or deteriorated sections in-kind. No additional curbing would be added.	Replace existing stone curbs with milled stone curb on aggregate base. Add new curbing, where needed.
Walkways	Remove non-historic rolled asphalt sidewalks entirely if not part of original design. Replace rolled asphalt sidewalks with historically accurate appearing material.	Reconstruct and widen rolled asphalt sidewalks to five feet.
Drainage	Reestablish appropriate drainage through historic walls, where possible; install new drop inlets as necessary.	Reestablish appropriate drainage through historic walls, where possible; install new drop inlets as necessary.
Guiderails	Install wooden guiderails where part of original design, using historic design.	Install new concrete core guardwalls and new timber guiderails at specified locations.
Parking Areas	Repave parking areas.	Repave parking areas.
PARTIAL REHABILITATION		
Fill Slopes	No fill slope or retaining wall reconstruction.	No fill slope or retaining wall reconstruction.
Guardwalls	Total to partial reconstruction of historic stone guardwalls at the overlooks with the original stone, adding stones as needed to replace missing or broken stones, to original 22-inch height.	Total to partial reconstruction of historic stone guardwalls with concrete core stone walls to original 22-inch height.
Stone Curbs	Reset stone curbing to new grades, and replace missing and/or deteriorated sections in-kind. No additional curbing would be added.	Replace existing stone curbs with milled stone curb on aggregate base. Add new curbing, where needed.
Walkways	Remove non-historic rolled asphalt sidewalks entirely if not part of original design. Replace rolled asphalt sidewalks with historically accurate appearing material.	Reconstruct and widen rolled asphalt sidewalks to five feet.
Drainage	No drainage repairs.	No drainage repairs.
Guiderails	Install wooden guiderails where part of original design, using historic design.	Install new concrete core guardwalls and new timber guiderails at specified locations.
Parking Areas	Repave parking areas.	Repave parking areas.
SPOT REPAIR		
Fill Slopes	No fill slope or retaining wall reconstruction.	No fill slope or retaining wall reconstruction.
Guardwalls	Repair historic stone guardwalls (e.g., replace missing stones).	Repair historic stone guardwalls with concrete core stone walls to original 22-inch height.
Stone Curbs	Repair stone curbs, resetting to new grades.	Replace existing stone curbs with milled stone curb on aggregate base.
Walkways	Replace rolled asphalt sidewalks with historically accurate appearing material.	Repair rolled asphalt sidewalks.
Drainage	No drainage repairs.	No drainage repairs.
Guiderails	Install wooden guiderails where part of original design, using historic design.	No wooden guiderails installation at overlooks.
Parking Areas	Repave parking areas.	Repave parking areas.

FUNDING

Under alternative B, the preliminary design estimate for rehabilitating 43 overlooks and parking areas in the Central District is \$4.3 million. The projected funding necessary to conduct the rehabilitation work at the first five overlooks under this alternative is estimated to be \$1.7 million. Under alternative C, projected funding is estimated to be \$2.4 million for the first five overlooks. The remaining overlooks that require partial reconstruction or spot repair would be addressed as funding permits.

CONSTRUCTION STAGING

Under both action alternatives, staging areas for construction equipment and vehicles would be located in several designated areas throughout the park, depending on where the construction was occurring. The areas include: Dickey Ridge Visitor Center (housing circle); Jenkins Gap parking area; Piney River; Maintenance Area; Pass Mt. Fire Rd; Pinnacles (Old Dump); Jewell Hollow Overlook (upper lot); Hughes River (east side of drive); Hughes River Overlook; Crescent Rock Overlook (upper portion); Big Meadows Boneyard; Camp 3 (north of MP 62); Swift Run Gap (stone shed); Simmons Gap (west); Powell Gap; Two Mile Run (south of Overlook). The staging areas were sited in areas that would have minimal impacts to the park's natural, biological, and cultural resources. They are not situated adjacent to any of the park's streams, which minimize the possibility of polluted runoff entering the watershed. All staging areas are located in previously disturbed areas with hardened surfaces where equipment can be parked without adversely affecting soils or vegetation, and where there would be no impacts to any of the park's significant cultural or historic features.

MITIGATION MEASURES OF THE ACTION ALTERNATIVES

The NPS places a strong emphasis on avoiding, minimizing, and mitigating potentially adverse environmental impacts. To help ensure the protection of natural and cultural resources and the quality of the visitor experience, the NPS would ensure that the following protective measures are implemented as part of either of the action alternatives. The NPS would implement an appropriate level of monitoring throughout the construction process to help ensure that protective measures are being properly executed and are achieving their intended results.

Additionally, although the EA addresses the entire project, the park would be required to review the document at the commencement of each phase to ensure that all project information is up to date and in compliance with the necessary regulations (e.g., Endangered Species Act). This review would occur with the completion of detailed design drawings at each phase and would be addressed with the appropriate level of NEPA compliance and documenting all pertinent contacts with the U.S. Fish and Wildlife Service and the State Historic Preservation Officer.

NATURAL PHYSICAL RESOURCES (SOILS AND AIR QUALITY)

During construction, alter drainage so that water is not directed down steep slopes, thus decreasing its velocity and erosion potential.

Armor ditches on a site-by-site basis to prevent scouring and erosion.

Provide culvert outlet protection (riprap aprons or basins) to reduce water velocity and prevent scour erosion.

Revegetate all disturbed soil.

Limit idling times on diesel-powered engines to 3 to 5 minutes.

Utilize water or appropriate liquids for dust control on materials stockpiled on ground surfaces and during land clearing, grading, and other activities.

Cover open-body trucks for transporting materials.

Produce concrete and asphalt outside of Shenandoah National Park.

Implement dust control measures (best management practices) to the greatest extent practical.

WATER RESOURCES

Prepare and implement an erosion and sediment control plan, consistent with Virginia Erosion and Sediment Control Law, Regulations, and Certification Regulations (VESCL&R) (VDCR 2006).

Avoid impacts to streams associated with the placement of fill, modification of channels, or changes in natural flows.

Minimize erosion from construction activities through the use of silt fences and/or erosion control blankets.

Prior to construction, submit a hazardous spill plan, stating what actions would be taken in case of a spill. This plan would incorporate preventative measures to be implemented such as the placement of refueling facilities, storage, and handling of hazardous materials, and notification procedures for a spill. Ensure that waste oil, antifreeze, hydraulic fluid, and grease are not spilled or disposed of anywhere in the park.

Minimize adverse effects of fuel spills through the following:

- Locate construction staging areas away from surface water features.
- Locate activities such as refueling well away from surface water features.
- Designate areas where refueling or construction vehicle and equipment maintenance would be performed and have containment devices such as temporary earth berms around these areas.
- Have absorbent pads available to clean up spills.

VEGETATION

Require that the project area be surveyed by an NPS biologist prior to the onset of construction for the presence of listed or rare species.

Minimize cutting trees whenever possible.

Minimize trimming and removing vegetation to accommodate construction equipment ingress and egress.

Avoid collision of equipment with trees and other vegetation. Place protective fencing around tree trunks in close proximity to construction activities to minimize potential adverse effects to bark or other tree attributes resulting from collision.

Assure that any fill material imported to the site is certified free of exotic plants and seeds.

Require the construction contractor to powerwash all construction vehicles and equipment prior to initial arrival at the park to remove seed and plant material.

Revegetate disturbed areas, including staging areas, as soon as possible with a native seed mix to help prevent the spread of exotic invasive plant species.

Enact monitoring protocol to ensure no exotic invasive plant species have spread into the project area.

Delineate and protect from construction activities those areas where state sensitive and state rare plant species are known to occur.

Ensure that all protection measures are clearly stated in construction specifications, and that workers would be instructed to avoid conducting activities beyond the construction zone, as defined by the roadway or construction zone fencing.

If work extends beyond paved roadways and curbs, install construction fencing to clearly delineate the project disturbance limits prior to commencement of work by the contractor.

WILDLIFE

Require that the project area be surveyed by an NPS biologist prior to the onset of construction for the presence of listed or rare species.

Prohibit feeding wildlife.

Ensure that food is stored in enclosed portions of vehicles or in hard-sided containers.

Ensure that trash from meals is disposed of via complete removal from the park or via park trash cans and dumpsters. Open barrels, pickup truck beds, and dump truck beds are not to be used for disposal or accumulation of food scraps or food wrappers or containers.

THREATENED AND ENDANGERED SPECIES

Provide construction workers with a photograph of the Shenandoah salamander and instruct workers to stop all work if a Shenandoah salamander is encountered at the site, and notify the NPS immediately. Prior to initiating any of the proposed projects, qualified park staff would survey the area for state-listed species. If a listed or rare species is found to occur on-site, the area where the species is located would be cordoned off, and construction workers would be instructed by park biologists on the best methods of avoid impacts to the species.

CULTURAL RESOURCES

Minimize impacts to the cultural landscape by ensuring that the rehabilitation of the park's overlooks be conducted in a manner consistent with the Secretary of Interior's *Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes*.

Emphasize preservation as the preferred treatment for significant landscape features; retain and repair original features and materials to the extent practical and replace materials in-kind when necessary.

Halt or redirect work to another area of the project in the event that potentially significant deposits or features are discovered during construction until finds can be documented, their significance assessed, and appropriate mitigation strategies developed in consultation with the Virginia State Historic Preservation Office.

An archeologist will monitor the Limberlost parking area during all ground-disturbing construction activity to ensure avoidance of any potentially significant archeological resources.

In the unlikely event that human remains or cultural items subject to the Native American Graves Protection and Repatriation Act (NAGPRA) are discovered, stop work in the area of the find and follow the appropriate provisions of NAGPRA implementing regulations (43 CFR 10).

Stage construction equipment only in designated construction staging areas as defined in the construction specifications.

TRANSPORTATION AND TRAFFIC

Conduct all construction activities during daylight hours to avoid noise impacts to campers.

Avoid construction during peak visitor use periods (e.g., weekends, holidays, and in the fall during peak colors).

During construction activities that could disrupt traffic (e.g., removal of informal pull-offs, warning signs and/or flaggers would be used to direct traffic through construction areas as needed.

Develop a safety plan prior to initiation of construction to ensure the safety of park visitors, workers, and park personnel.

Limit traffic delay times for road construction to no more than 15 minutes.

Ensure that any lighting, such as security lighting, would be directional and shielded to prevent intrusions into the night sky.

ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD

No other reasonable alternatives were identified during the alternative development process.

THE ENVIRONMENTALLY PREFERRED ALTERNATIVE

The environmentally preferred alternative is defined by CEQ as the alternative that would promote the national environmental policy as expressed in NEPA Section 101. This includes:

1. Fulfilling the responsibilities of each generation as trustee of the environment for succeeding generations;
2. Assuring for all generations safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
3. Attaining the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;
4. Preserving important historic, cultural and natural aspects of our national heritage and maintaining, wherever possible, an environment that supports diversity and variety of individual choice;
5. Achieving a balance between population and resource use that would permit high standards of living and a wide sharing of life's amenities; and
6. Enhancing the quality of renewable resources and approaching the maximum attainable recycling of depletable resources (NEPA, Section 101).

Simply put, this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources (CEQ, *NEPA's 40 Most Asked Questions*, 6a). After completing the environmental analysis, the NPS identified alternative B as the environmentally preferred alternative in this EA because it best meets the definition established by the U.S. Council on Environmental Quality. Alternative B restores and preserves the historic character of the overlooks by removing non-historic elements and, where necessary, repairing or replacing important character-defining features such as stone curbing, walkways, and stone retaining walls. This alternative also improves public safety by repairing and stabilizing the overlooks, and improves park operations efficiency by reducing the need for future overlook maintenance. In addition, the overall experience of the park visitors would be enhanced as the parking at the overlooks is improved and by maintaining the historic character of the overlooks.

Table 2 on the following page compares how well each of the proposed alternatives meets the purpose and need of the project. The "Environmental Consequences" chapter describes the effects on each impact topic under each of the alternatives. These impacts are summarized in Table 3.

TABLE 2. COMPARISON OF THE EXTENT TO WHICH EACH ALTERNATIVE MEETS THE PROJECT PURPOSE AND NEED

Purpose	Alternative A – No Action Alternative	Alternative B – Rehabilitation with Preservation and Rehabilitation of Historic Features (Preferred Alternative)	Alternative C – Rehabilitation Based on Engineering Study Recommendations
Restores and rehabilitates the overlooks while preserving their historic character	<i>Does not fully meet the purpose and need.</i> While the park's overlooks would be maintained with historical character in mind, and as funding allows, no active measures would be taken to fully rehabilitate those overlooks that have degraded.	<i>Meets the purpose and need.</i> The deteriorating historic stone guardwalls, retaining walls, and parking areas at 49 overlooks would be rehabilitated. This rehabilitation effort would be done in a manner that places emphasis on preserving the historic character of overlooks. In addition, historically inappropriate additions to the overlooks (e.g., rolled asphalt curbs and paved sidewalks) would be removed.	<i>Does not fully meet the purpose and need.</i> The overlooks would be rehabilitated based on recommendations from the engineering study. Non-historic rolled asphalt sidewalks would be reconstructed and widened to five feet. However, there would be less emphasis on specific historically significant elements of the road and overlooks.
Improves public safety	<i>Meets the purpose and need.</i> Road repairs and maintenance would be completed when funds are available or safety deficiencies occur to ensure public safety.	<i>Meets the purpose and need.</i> Pavement deterioration at the overlooks would be addressed through repaving and other repairs. Rolled asphalt curbs would be removed, thus, making the overlooks more safe and accessible for persons with disabilities.	<i>Meets the purpose and need.</i> Pavement deterioration at the overlooks would be addressed through repaving and other repairs. The rolled asphalt sidewalks would be reconstructed and widened to five feet, thus, making the overlooks more safe and accessible for persons with disabilities.
Enhances visitor enjoyment and historic interpretation of the park.	<i>Does not fully meet the purpose and need.</i> While repairs and maintenance would be completed when funds are available or when safety deficiencies arise, deterioration of historic stone guardwalls, retaining walls, and parking areas at overlooks would not be fully rehabilitated, which could negatively affect visitor enjoyment and historic interpretation of the park.	<i>Meets the purpose and need.</i> The actions detailed under this alternative would enhance visitor enjoyment and historical interpretation. Historic stone guardwalls, retaining walls, and parking areas at 49 overlooks would be rehabilitated and historically inappropriate additions to the overlooks (e.g., rolled asphalt curbs and paved sidewalks) would be removed allowing for better historic interpretation of these park resources.	<i>Does not fully meet the purpose and need.</i> Historical interpretation would not be fully realized because the rehabilitate/reconstruction of the historic features would use non-historically accurate materials, (e.g., concrete core guardwalls, repair/widening of rolled asphalt sidewalks), degrading historically significant elements.

TABLE 3. SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Impact Topic	Alternative A – No Action Alternative	Alternative B – Rehabilitation with Preservation and Rehabilitation of Historic Features (Preferred Alternative)	Alternative C – Rehabilitation Based on Engineering Study Recommendations
Soils	Implementation of the no action alternative would result in long-term minor adverse impacts to soils related to existing drainage deficiencies. Long-term minor adverse cumulative impacts would occur in the vicinity of the overlooks along Skyline Drive. There would be no impairment of soil resources under the no action alternative.	Implementation of alternative B would result in short-term and long-term minor adverse impacts to soils from the increased potential for erosion, compaction, paving, and disturbance of soils resulting from construction activities. Long-term minor beneficial impacts at both the overlooks and along sections of Skyline Drive would result from improved drainage, reduced erosion and by rehabilitating six non-historic/informal pull-offs along Skyline Drive. Short-term minor adverse cumulative impacts would occur in the vicinity of Skyline Drive. There would be no impairment of soil resources under Alternative B.	Implementation of alternative C would result in short-term and long-term minor adverse impacts to soils from the increased potential for erosion, compaction, paving, and disturbance of soils resulting from construction activities. Long-term minor beneficial impacts at both the overlooks and along sections of Skyline Drive would result from improved drainage, reduced erosion and by rehabilitating six non-historic/informal pull-offs along Skyline Drive. Short-term minor adverse cumulative impacts would occur in the vicinity of Skyline Drive. There would be no impairment of soil resources under alternative C.
Threatened and Endangered Species	Implementation of the no action alternative would result in long-term negligible adverse impacts and cumulative impacts to the federally endangered Shenandoah salamander and other listed or rare species related to ongoing overlook maintenance and emergency repairs. There would be no adverse or beneficial cumulative impacts related to the Shenandoah salamander; however, there could be short-term negligible adverse cumulative impacts to any state-listed species found within the general vicinity of the construction. No impairment of special status species would occur under the no action alternative.	Implementation of alternative B would result in short- and long-term negligible adverse impacts to the federally endangered Shenandoah salamander and other state-listed or rare species related to the rehabilitation of the park's overlooks. There would be no adverse or beneficial cumulative impacts directly related to the Shenandoah salamander; however, short-term negligible adverse cumulative impacts to any state-listed species found within the general vicinity of the construction could occur. No impairment of special status species would occur under alternative B.	Implementation of alternative C would result in short- and long-term negligible adverse impacts to the federally endangered Shenandoah salamander and other state-listed or rare species related to the rehabilitation of the park's overlooks based on engineering recommendations. There would be no adverse or beneficial cumulative impacts directly related to the Shenandoah salamander; however, there could be short-term negligible adverse cumulative impacts to any state-listed species found within the general vicinity of the construction. No impairment of special status species would occur under alternative C.
Cultural Landscapes	Implementation of the no action alternative would result in short-term minor adverse impacts on the cultural landscape due to the continued deterioration of the Skyline Drive overlooks and the periodic closures required for their repair. Short- and long-term minor adverse cumulative impacts would occur. No impairment of the park's cultural landscape would occur under the no action alternative.	Rehabilitation of the overlooks following the Secretary of the Interior's standards and guidelines would result in short-term minor adverse impacts (no adverse effect under Section 106) during temporary closures related to construction and long-term moderate beneficial impacts (no adverse effect under Section 106) due to the maintenance and preservation of the overlooks' historic function and appearance. Long-term moderate beneficial cumulative impacts to the Skyline Drive cultural landscape would occur in alternative B. No impairment of the park's cultural landscape would occur under alternative B.	Rehabilitation of the overlooks according to the 2001 Engineering Study recommendations would result in short-term and long-term minor adverse impacts (no adverse effect under Section 106) to the cultural landscape due to temporary road closures and some changes to the landscape's historic character. Long-term minor adverse cumulative impacts to the Skyline Drive cultural landscape would occur under alternative C. No impairment of the Skyline Drive cultural landscape would occur under alternative C.

Impact Topic	Alternative A – No Action Alternative	Alternative B – Rehabilitation with Preservation and Rehabilitation of Historic Features (Preferred Alternative)	Alternative C – Rehabilitation Based on Engineering Study Recommendations
Visitor Use and Experience	Implementation of the no action alternative would result in long-term minor adverse impacts to visitor use and experience due to the continued deterioration of the park's overlooks. Long-term minor cumulative impacts related to traffic delays would occur but long-term minor beneficial cumulative impacts would result from the road and facility improvements.	Implementation of alternative B would result in short-term minor adverse impacts to visitor use and experience from delays to traffic, overlook and trailhead parking area closures, and disruptions caused by construction activities along Skyline Drive and at the overlooks. Long-term minor beneficial impacts to visitor use and experience would occur as a result of improved overlooks and parking areas. Short-term minor adverse cumulative impacts would result from construction with long-term minor beneficial cumulative impacts resulting from overall road improvements within the park.	Implementation of alternative C would result in short-term minor adverse impacts to visitor use and experience from delays to traffic, overlook closures, and disruptions caused by construction activities at the overlooks. By implementing the engineering recommendations, there would be short- to long-term minor adverse impacts on park visitors experience from the presence of work crews and traffic delays to overall changes in the historic landscape. Long-term minor beneficial impacts to visitor use and experience would occur as a result of improved parking areas. Short-term minor adverse cumulative activities would occur related to construction with long-term beneficial cumulative impacts resulting from overall road improvements within the park.
Health and Safety	Implementation of the no action alternative would result in long-term minor adverse impacts to health and safety as a result of continued safety deficiencies at the overlooks. Cumulative impacts to emergency services would be short-term, minor and adverse, but beneficial in the long term due to improved park roads.	Implementation of alternative B would result in short- to long-term negligible to minor adverse impacts to health and safety during construction and long-term minor beneficial impacts following construction as a result of the correction of safety deficiencies at the overlooks and making the overlooks more accessible for people with limited mobility. Cumulative impacts would be short-term minor adverse and long-term minor beneficial following construction.	Implementation of alternative C would result in short-term negligible to minor adverse impacts to health and safety during construction and long-term minor beneficial impacts following construction as a result of correcting safety deficiencies and reconstructing and widening rolled asphalt sidewalks at the overlooks , making it more accessible for people with limited mobility. Cumulative impacts would be short-term minor adverse and long-term minor beneficial following construction.
Park Operations	Implementation of the no action alternative would result in long-term minor adverse impacts to park operations due to the continued deterioration of the overlooks, which would lead to increased future maintenance. Cumulative impacts to park operations and maintenance would be long-term minor adverse.	Implementation of alternative B would reduce the amount of long-term and emergency maintenance needed for the overlooks located along Skyline Drive, resulting in long-term minor beneficial impacts. Long-term minor beneficial cumulative impacts to park operations would occur.	Implementation of alternative C would reduce the amount of long-term and emergency maintenance needed for the overlooks located along Skyline Drive, resulting in long-term negligible beneficial impacts. Long-term minor beneficial cumulative impacts to park operations would occur.

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AFFECTED ENVIRONMENT

This chapter of the EA describes existing environmental conditions in the areas potentially affected by the alternatives evaluated. This section describes the following resource areas: natural physical resources (soils and threatened, endangered, and species of special concern); cultural landscapes; visitor use and experience; health and safety; and park management and operations. Potential impacts are discussed in the “Environmental Consequences” chapter.

SOILS

Soils information is incomplete for the Shenandoah National Park as some areas of this portion of the Blue Ridge Mountains have not been mapped. The dominant soil groups in and around Shenandoah National Park are Ochrepts and Udults. They are moderately deep and medium textured. These soils have a mesic temperature regime, an udic moisture regime, and mixed mineralogy. The soil categories with series likely occurring along Skyline Drive are Dystrochrepts, Hapludults, and Haplumbrepts. The principal soils on steep slopes of lower mountains are Dystrochrepts containing Ashe, Ditney, Sylco, Brookshire, and Ramsey series and Hapludults with Edneyville and Saluda series. The Hapludults with Fannin, Evard, and Porters series are on the rolling foothills. Boulders and outcrops of bedrock are conspicuous but not extensive on mountain slopes. Haplumbrepts with Burton series are dominant at higher elevations (McNab 1994; USDA nd; USDA 1981). Table 4 outlines the characteristics of each predominate soil series that may occur along Skyline Drive.

TABLE 4. GENERAL CHARACTERISTICS OF SOILS IN VICINITY OF SKYLINE DRIVE

Soil Series	Location	Depth	Slope (%)	Elevation (ft)	Drainage	Permeability
Ashe	Ridges and side slopes	Moderate	2 – 95	1,400 to 5,000	Excessive	Moderately rapid
Ditney	Ridges and side slopes	Moderate	8 – 95	1,800 to 4,800	Well drained	Rapid
Sylco	Mountain ridge summits and side slopes	Moderate	7 – 95	1,800 to 4,500	Excessive	Moderate
Ramsey	Plateaus and upper slopes	Shallow	3 – 70	NA	Excessive	Rapid
Edneyville	Ridges and side slopes	Very deep	2 – 95	1,400 to 5,000	Well drained	Moderately rapid
Saluda	Crests and steep slopes	Shallow	25 – 90	1,500 to 5,000	Well drained	Moderate
Fannin	Ridges and side slopes	Very deep	6 – 95	1,400 to 4,000	Well drained	Moderate
Evard	Rides and side slopes	Very deep	15 – 50	1,400 to 4,000	Well drained	Moderate
Porters	North and east facing ridges and side slopes	Deep	NA	3,000 to 4,800	Well drained	Moderate
Burton	Ridges and side slopes	Moderately deep	5 – 95	4,800 to 6,000	Well drained	Moderate

Source: Soil series information from USDA nd.
NA – not available

THREATENED, ENDANGERED, AND SPECIES OF SPECIAL CONCERN

Located within the general vicinity of Skyline Drive and several overlooks lies the habitat for the Shenandoah salamander (*Plethodon shenandoah*), a federally endangered species. The Shenandoah salamander is a small terrestrial salamander that exists entirely within Shenandoah National Park on only three mountains, including Hawksbill, Stony Man, and The Pinnacle, at elevations above 3,000 feet (USFWS 1994). It is found on talus slopes with deep pockets of soil in mixed conifer forest on the north and northwestern faces of these mountain ranges. Listed as endangered by the Commonwealth of Virginia on October 1, 1987, the Shenandoah salamander was designated federally endangered on August 18, 1989. Initially, the Shenandoah salamander was believed to be endangered exclusively by natural biological causes. However, it now appears that certain human-related factors, such as acid deposition and forest defoliation associated with introduced pest insects, are likely to have adverse effects on the salamander (USFWS 1994).

All members of the genus *Plethodon* are terrestrial and sometimes referred to as woodland salamanders. These salamanders are generally found in forested conditions, where the presence of an overstory

promotes surface moisture. They are primarily nocturnal, spending the day under protective cover or in rock crevices; their movements are restricted during droughts (USFWS 1994). The diet of woodland salamanders generally consists of insects and other soil invertebrates. The breeding stage frees these salamanders from a mandatory proximity to open or flowing water. Small egg clusters (3-17 eggs) are laid in damp logs, moss, or other available crevices, and the female generally guards the eggs. Incubation lasts one to three months, during which time the female does not forage for food. Females usually do not breed before the age of four years, and generally breed only every other year thereafter. Adult survival was found to be high with a small percentage surviving 25 years or longer (USFWS 1994).

Past effects of naturally occurring fires, farming, and timbering operations (which occurred prior to the establishment of Shenandoah National Park in 1936) on the current limited distribution of the Shenandoah salamander is not known. Current natural threats to this salamander's continued existence include: (1) competition with the red-backed salamander (*Plethodon cinereus*), which confines the Shenandoah salamander to a few relatively dry talus areas that are not utilized by this competitor; and (2) eventual succession of this talus, through weathering and soil formation, to moister habitat more suitable for occupation by the red-backed salamander. The red-backed salamander is widely distributed and completely surrounds each of the three isolated populations of the Shenandoah salamander (USFWS 1994).

Along with these naturally occurring threats to the salamander's continued existence, two major, relatively recent human related factors appear to also have the potential to further impact the species. These include: (1) defoliation of trees within its habitat associated with outbreaks of gypsy moths (*Lymantria dispar*), hemlock woolly adelgids (*Adelges tsugae*), or other introduced forest pest species; and (2) further debilitation of overstory vegetation, changes in soil chemistry, and direct impacts to the salamanders associated with acid rain and other sources of air pollution (USFWS 1994).

The spread of introduced forest pest species within the range of the Shenandoah salamander is too recent to have documented effects on the salamanders. However, defoliation and tree mortality associated with gypsy moths is well documented, and the hemlock woolly adelgid is becoming a serious threat to hemlock survival within Shenandoah National Park. Habitat changes associated with these insect pests could result in adverse effects to Shenandoah salamanders. For example, in certain sections of Shenandoah salamander habitat where hemlock mortality is high (e.g., Stony Man), the duff layer now consists almost entirely of hemlock needles. This would certainly lower substrate pH, which in turn could alter soil microbe and invertebrate composition with unknown effects to salamander physiology and foraging success. Defoliation caused by gypsy moths results in increased ground-level isolation, at least temporarily, with unknown effects to salamanders. One possible result of defoliation is the increased exposure of the talus substrate to sunlight, which warms and dries the substrate beyond the Shenandoah salamander's tolerance or reproductive limits (USFWS 1994).

Acid deposition and other sources of air pollution are well documented at Shenandoah National Park. As with forest pests, effects of these factors on Shenandoah salamanders have not been documented; however, numerous studies have indicated that amphibians may be vulnerable to the effects of acid deposition, particularly in mountain areas. Although the Shenandoah salamander does not have an aquatic larval stage, acidification of its habitat substrate could affect the species' food supply or could impair reproduction by directly affecting courtship, egg hatchability, or neonate viability. Because salamanders forage preferentially during rainy or foggy weather, they would be particularly susceptible to any directly irritating effects acid deposition may have on their skin.

Within the park, 62 state-listed rare plant species are documented. Of these, three species are globally rare, while 59 species are globally secure but state rare. Within the general vicinity of 5 to 10 overlooks along Skyline Drive there are small populations of state sensitive and state rare plant populations (Ludwig et al., 1993). The park performs general monitoring of each rare plant population once every five years. Certain populations, such as those along Skyline Drive, or on rock outcrop areas are monitored more frequently or with greater intensity because of known threats. The population is then examined for any signs of disturbance, and assigned a percent value for age structure, phenology, vigor, and area covered.

At this time, general monitoring data has been collected for approximately 80 percent of the park's rare plant populations.

CULTURAL LANDSCAPES

As defined by the Secretary of the Interior's *Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes* (Birnbaum 1996), cultural landscapes consist of "a geographic area (including both cultural and natural resources and the wildlife or domestic animals therein) associated with an historic event, activity, or person or exhibiting other cultural or aesthetic values." Authorized by act of Congress in 1926, Shenandoah National Park's Skyline Drive comprises a cultural landscape.

The Skyline Drive Historic District is considered one of the park's 13 defined cultural landscapes. Originally listed on the National Register in April 1997, boundary increases enlarged the National Register historic district in September 1997 and December 2003. The Skyline Drive Historic District includes the 105-mile, ridge-top roadway from Front Royal to Rockfish Gap and its adjoining overlooks, lodges, cabin camps, gas stations, riding stables, wayside stations, picnic areas, and other developed areas. The district contains over 33,000 acres of land and more than 400 contributing buildings, structures, and objects. The roadway includes the original 97 miles of Skyline Drive built between 1931 and 1939, and eight miles of the Blue Ridge Parkway, built between 1936 and 1937 and legislatively transferred to the NPS in 1961. Skyline Drive is significant under National Register criterion A under the theme of politics and government for its association with Depression-era work-relief projects. These work-relief projects employed millions of Americans in large public works construction projects designed to help alleviate the Depression's ill effects and restore the American economy. Skyline Drive is also significant under criterion C under the theme of landscape architecture. The roadway and its overlooks reflect the NPS's landscape design aesthetics and standards developed during the 1920s and 1930s for scenic and recreational highways. The district is also significant in the areas of transportation, social history, entertainment/recreation, architecture, engineering, conservation, and community planning and development. Despite the continuing evolution of Shenandoah National Park, Skyline Drive, its overlooks, and supporting structures possess historic integrity.

By definition, cultural landscapes consist of two principal organizational elements, spatial organization and land patterns, and several other character-defining landscape features including buildings and structures, vegetation, circulation, views and vistas, cluster arrangement, water features, and small-scale features. The paramount attribute of the organizational elements and the character-defining features are their interrelationships in space. Individual features of the landscape are never examined alone but only in relationship to the overall landscape. The arrangement and interrelationship of a cultural landscape's organizational elements and character-defining features provide the key to determining the potential impacts and effects of the proposed improvements to the cultural landscape (Birnbaum 1996).

Skyline Drive's organizational elements encompass a spatial organization comprised of the two-lane, curvilinear park road functioning as a central spine through the park designed to provide pleasurable driving experiences through natural landscape to park visitors, interspersed by developed areas composing Skyline Drive's principal land patterns. Skyline Drive and its overlooks comprise primary elements, and perhaps the most significant of Shenandoah National Park's character-defining features. Even before the park was established in 1935, the Southern Appalachian National Park Committee, appointed by Congress in 1924, envisioned Skyline Drive as an important link in an eastern network of park-to-park highways that would extend from Washington, D.C., to Mammoth Cave in Kentucky, years before the plans for "an eastern network" was envisioned by William Carson in 1931. The ridge-top drive was designed to preserve that adjacent natural scenery while providing opportunities for users to experience the park's natural beauty at its numerous scenic parking overlooks. In addition to the natural scenic areas, the drive's land patterns include developed areas such as overlooks providing entryways to adjacent recreational trails and park features, gas and food wayside stations for motorists, picnic grounds, campgrounds, overnight accommodations, and other visitor services.

Other buildings and structures contributing to the Skyline Drive cultural landscape include a wide variety of resources; a tunnel, three cattle underpasses, one bridle path underpass, culverts, gutters, underdrains, guardwalls, embankments, entrance stations, wayside stations, picnic grounds, and other visitor facilities. Stone guardwalls laid along curves, straight sections with drop-offs, parking widenings, and overlooks consist of Dry-laid and /or mortared sandstone and greenstone schist and dark blue limestone erected between circa 1937 and 1958. By the 1950s slightly more than 43 miles of stone guardwalls had been installed along Skyline Drive and its overlooks. Many original sections of guardwalls, including some segments at or near overlooks, have been replaced since 1983 when the NPS began increasing guardwall height and installing concrete “core” structures with mortared stone veneers in order to withstand the impact of cars traveling at 35 miles per hour. While these replacement guardwalls are compatible with the district’s historic guardwalls, they are considered non-contributing elements of the drive’s cultural landscape.

Character-defining elements of the Skyline Drive cultural landscape’s vegetation principally consist of grass-covered shoulders and adjacent wildflowers and herbaceous plants, much of which can be observed from the overlooks. Mowed three-to-six times per year, the grass shoulders provide a natural appearance without obstructing views and sightlines. Sloping terrain located between the shoulders and the tree line is mowed once a year in order to allow wildflowers and herbaceous plants to develop that limit the growth of pioneer trees and shrubs. A variety of wildflowers as well as mountain laurel, rhododendron, azalea, and ferns also border the drive and contribute to the drive’s scenic qualities.

In addition to Skyline Drive serving as the principal circulation network through the cultural landscape, overlooks, parking widenings, paved parking areas, trail crossings, fire roads, and road traces contribute to the overall landscape’s circulation network. When originally completed, Skyline Drive featured more than 60 overlooks and road areas to accommodate viewers of the park’s outstanding vistas. Road widenings consist of paved wide spots along the drive that permit limited parking that may be more appropriately described as drive-through overlooks. The road widenings frequently only feature guardwalls. Parking overlooks, on the other hand, possess head-in parking incorporating landscape amenities such as planting islands with stone curbing, pedestrian walks, guardwalls and, originally, wood guiderails. Some overlooks also incorporate natural features such as rock outcroppings into their physical space. Earlier overlooks display a more deliberate approach and emphasis on picturesque qualities while later overlooks, especially in the northern portions of the drive, feature more utilitarian designs. Sixty-nine existing overlooks are considered contributing elements of the cultural landscape.

Additional elements of the drive’s circulation network include portions of the Appalachian Trail that parallel Skyline Drive. The Appalachian Trail crosses the scenic roadway 15 times throughout the park. Many fire roads also intersect Skyline Drive and typically comprise the remains of former mountain roads now closed to vehicular traffic. Additional fire roads were built by the CCC during the park’s period of initial improvement. Smaller trails intersecting the drive also served previously as mountain roads or were initially built by the CCC. Several trail segments can be accessed at the parking overlooks.

Originally, the path of Skyline Drive was mostly forested. Wide panoramic vistas of the mountains and the valley fields and pastures were a byproduct of prior land clearance activities, and the subsequent young second-growth forest within the valleys before the park’s establishment. As the second-growth forest matured over the last 80 years, Skyline Drive’s views and vistas at overlooks were specifically created or framed by landscape architects and CCC laborers to take advantage of the former panoramic views. During the 1990s, drive-by vistas were cleared of vegetation and restored to their earlier aesthetically pleasing views.

The clustering of park amenities, such as visitor stops, comfort stations, gas stations, and picnic grounds, at waysides and developed areas along the drive helped maintain the park’s scenic qualities and also contributes to the cultural landscape. The drive also features three types of contributing water fountains constructed by the CCC that are contributing water features of the cultural landscape. One fountain type consists of a single boulder fitted with a bubbler and basin. A second type features randomly coursed

stone masonry incorporated into guardwalls. The third fountain type utilizes coursed, stacked rock construction.

Small-scale features contributing to the drive's cultural landscape include concrete milepost markers. The markers were originally installed around 1950 and supplied by the Blue Ridge Parkway. The mile post markers are considered one contributing element.

VISITOR USE AND EXPERIENCE

Shenandoah National Park provides a diverse range of easily accessible mountain recreation opportunities in close proximity to major eastern population centers. From Skyline Drive to wilderness trails, these facilities offer opportunities for outstanding scenic vistas and exposure to the diversity of Blue Ridge habitats and culture.

There are four entrances that visitors can use to enter the park: I-66 and Route 340 to the northern entrance at Front Royal, Route 211 to the central entrance at Thornton Gap, Route 33 to Swift Run Gap, and I-64 to the Rockfish Gap entrance at the southern end of the park and the northern end of the Blue Ridge Parkway. The speed limit for Skyline Drive is 35 mph.

According to NPS Visitation Database Reports (NPS 2005), over the past two decades, annual visitation levels have decreased somewhat and have stabilized in recent years at a level of approximately 1.3 million visitors annually. Park visitation is heaviest between April and November, with the highest monthly visitation occurring during the fall foliage season in October. In 2003, total annual visitation averaged 1,174,912 persons. Of this number, about 21% visited the park during the month of October. The next highest monthly visitations occurred during July and August; this attests for a little over 30% of the total annual visits. These three months alone account for approximately 51% of total annual park visitation. While summer visitation tends to be spread throughout all the days of the month, visitation during the October peak is concentrated more heavily on the weekends, when day visitors from nearby metropolitan areas predominate.

Shenandoah is a "drive-through" type of park. More than half of all visitors reported that the only park activity they participated in was sightseeing along Skyline Drive. As part of Shenandoah National Park's 2001 Visitor Study, it was shown that most visitors (74%) spent less than one day (24 hours) at the park. The most important reasons for visiting the park were to see the views from the scenic drive/overlooks (87%) and enjoy solitude/natural quiet (75%) (Littlejohn 2002). Other activities shown to be important to park visitors included:

- Wildlife observation/nature study
- Photography
- Spending time in visitor centers
- Walking for pleasure
- Day hiking
- Picnicking

The park includes more than 500 miles of trails, including 101 miles of the Appalachian Trail. Many trails are accessed from Skyline Drive. Three visitor/information centers are found along Skyline Drive in Shenandoah National Park: Loft Mountain Information Center; Byrd Visitor Center, located at Big Meadows; and Dickey Ridge Visitor Center. These visitor centers provide information, exhibits, illustrated programs; and offer sales of books, slides, posters, and maps about the park. All of these facilities are open seasonally from spring to fall (NPS 2002b). These existing visitor learning facilities are located at high elevations and are inaccessible in inclement weather and during winter months.

HEALTH AND SAFETY

The NPS is committed to providing appropriate, high-quality opportunities for visitors and employees to enjoy the parks in a safe and healthful environment. The NPS strives to protect human life and provide for

injury-free visits. One of the core values of the NPS, as stated in the *2006 Management Policies* (NPS 2000c) and Director's Order 50B, *Occupational Safety and Health Program* (NPS 1999), is the safety and health of its employees, contractors, volunteers, and the visiting public. It is the policy of the NPS to provide a safe and healthful place of employment to protect federal and private property from accidental damage or loss, and to meet or exceed all applicable statutory, regulatory, and policy requirements relating to safety, health, and the environment.

The overlooks and parking areas immediately adjacent to Skyline Drive were found in good to poor condition. Safety deficiencies occurring at those overlooks found in poor conditions include uneven pavement, potholes, and degrading guardwalls (FHWA 2001).

PARK MANAGEMENT AND OPERATIONS

Skyline Drive provides the only access to most of the park's administrative and recreational areas including the Byrd Visitor Center, all of the park's historic overlooks, sections of the Appalachian Trail within the park, and, and camping areas such as Big Meadows, Loft Meadows, and Mathew's Arm, among others. Skyline Drive provides both northbound and southbound access to these facilities.

The current maintenance schedule within the park includes roadway maintenance as needed; snow removal as needed; removal of hazard trees and limbs for two weeks each year; and annually cleaning up to 350 (25%) of culverts and drop inlets. Snow removal is the only type of maintenance that requires periodic road closures. There is no regularly scheduled maintenance of guardwalls at the overlooks or along the road (Herzog 2005). Maintenance at the overlooks is performed as necessary and as funding allows.

ENVIRONMENTAL CONSEQUENCES

GENERAL METHODOLOGY FOR ESTABLISHING IMPACT THRESHOLDS AND MEASURING EFFECTS

The “Environmental Consequences” chapter addresses the potential impacts to each of the resource areas (e.g., impact topics) for each of the alternatives. Each action alternative is compared to the no action alternative, or baseline condition of pre-road rehabilitation, to determine resource impacts. In the absence of quantitative data, best professional judgment was used. In general, impacts were determined through consultation and collaboration with a multidisciplinary team of NPS, FHWA, and professional staff. Regulatory agency consultation with the USFWS, and other existing data sources such as the Virginia State Historic Preservation Officer, transportation volume and safety studies, and park planning documents were also used to assess the potential impact of each alternative.

Impacts are classified as either direct or indirect. A direct impact is an impact that occurs as a result of the proposal or alternative in the same place and at the same time as the action. An indirect impact is any reasonably foreseeable impact that occurs as a result of, and after, the proposed action. These are future impacts, or the impacts of reasonably expected connected actions (NPS 2000c).

Potential impacts of all alternatives are described in terms of type (beneficial or adverse); context; duration (short- or long-term); and intensity (negligible, minor, moderate, major). Definitions of these descriptors include:

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

Adverse: A change that declines, degrades, and/or moves the resource away from a desired condition or detracts from its appearance or condition.

Context: Context is the affected environment within which an impact would occur, such as local, park-wide, regional, global, affected interests, society as whole, or any combination of these. Context is variable and depends on the circumstances involved with each impact topic. As such, the impact analysis determines the context.

Duration: The duration of the effect is described as short-term or long-term. Duration is variable with each impact topic, therefore, definitions related to each impact topic are provided in the specific impact analysis narrative.

Intensity: Because definitions of impact intensity (negligible, minor, moderate, and major) vary by impact topic, intensity definitions are provided separately for each impact topic analyzed.

CUMULATIVE IMPACTS

NEPA regulations require an assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions” (40 CFR 1508.7). Cumulative effects can result from individually minor, but collectively moderate or major actions that take place over a period of time.

Cumulative impacts are considered for all alternatives, including the no action alternative. Cumulative impacts were determined by combining the impacts of the alternative being considered with other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify ongoing or reasonably foreseeable future projects at Shenandoah National Park and in the surrounding region that could collectively interact with the actions proposed in the alternatives.

New Comfort Station at Byrd Visitor Center

This project involved the construction of a new comfort station at the Byrd Visitor Center. The comfort station will be approximately 2,000 square feet (sf) and located adjacent to the existing Byrd Visitor Center. A plaza area with covered walkway will connect the new building to the visitor center. The completion of the new restrooms will allow the existing, non-accessible restroom space to be converted into an exhibit area. The work was completed in 2005. The area of construction is a previously disturbed area covered with manicured lawns and concrete walkways.

Interior Renovations and Exhibits at Byrd Visitor Center

This project fully rehabilitated the basement office space at the Byrd Visitor Center (2,157 sf). This includes a restroom, kitchenette, offices, work areas, a new secondary exit, and new HVAC equipment. The project also constructed a building addition (798 sf) for an elevator, a code-compliant stairway, and a balcony extension to maintain the after-hours viewing area. The project removed the existing restroom facilities and office space on the first floor and rehabilitated the area into the Information Service Desk and sales area for the park's cooperating association. As part of the rehabilitation, a fire suppression system was installed throughout the entire building. These renovations were conducted in 2005 and 2006/2007.

NPS and FHWA Roadway Improvement Projects Within the Park – Various roadway rehabilitation projects scheduled to occur by 2010 include:

- **Repair Byrd Visitor Center Access Road**

This project would repair the Byrd Visitor Center Access Road Route 38 in the Big Meadows developed area in Shenandoah National Park. The work would include milling and paving the existing road, performing spot repairs to aggregate base course, and overlaying with new asphalt pavement. Work would also include replacing drainage structures, grading ditches, stabilizing road shoulders, and restriping the road surface.

- **Repair Road to Stables, Wastewater Treatment Plant, and Housing Area at Skyland Area**

This project would repair the administrative road to the stables, wastewater treatment plant, and housing area of the Skyland developed area in Shenandoah National Park. The work would include milling and paving the existing road, performing spot repairs to aggregate base course, and overlaying with new asphalt pavement. Work would also include replacing drainage structures, grading ditches, stabilizing road shoulders, and restriping the road surface.

- **Repair Big Meadows Old Campground Access Road**

This project would repair the campground loops in the Old Campground of the Big Meadows developed area in Shenandoah National Park. The work would include milling and paving the existing road, performing spot repairs to aggregate base course, and overlaying with new asphalt pavement. Work would also include replacing drainage structures, grading ditches, stabilizing road shoulders, and restriping the road surface.

- **FHWA Spot Repair Along Skyline Drive**

This project would rehabilitate Skyline Drive in the Central District by removing and replacing asphalt pavement and aggregate base material in specified locations along Skyline Drive; placing 1-inch deep by 2-feet wide aggregate/topsoil shoulder mix; milling and overlaying asphalt pavement through Mary's Rock Tunnel; removing and replacing (in-kind) seven stone headwalls; removing and replacing (in-kind) one headwall/ drainage well; removing and replacing seven concrete drop inlets (lids to match historic lids); removing and replacing 12 culverts; placing aggregate rip rap at one culvert outfall; widening asphalt pavement in specified curves; regrading two culvert outlet ditches; and constructing two stone masonry aprons at drop inlets.

Area Projects

Area projects for transportation improvement and other development in the general vicinity of the road but outside of the park were examined. Agencies responsible for planning construction projects in the area of Shenandoah National Park include Virginia Department of Transportation and local communities. No projects for VDOT or the local communities were identified that would collectively interact with the actions proposed in the alternatives being considered.

IMPAIRMENT ANALYSIS

In addition to determining the environmental consequences of the alternatives under consideration, the NPS *2006 Management Policies* and DO-12 require analysis of potential effects to determine if actions would impair park resources and values. The fundamental purpose of the National Park Service, as established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. These laws give the NPS the management discretion to allow an impact to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values. NPS managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adversely impacting park resources and values.

The impairment that is 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 park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. Whether an impact meets this definition depends on the particular resources and values that would be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts. An impact to any park resource or value may constitute an impairment, but an impact would be more likely to constitute an impairment to the extent that it has a major or severe adverse effect upon a resource or value whose conservation is:

- Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- Key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or
- Identified as a goal in the park's general management plan (NPS 1983), resources management plan (NPS 1998a), or other relevant NPS planning documents.

An impairment determination is included in the conclusion statement of the impact analysis of each alternative. Impairment determinations are not made for health and safety, or park management and operations because impairment findings relate back to park resources and values, and these impact areas are not generally considered to be park resources or values. Impairment determinations are not made for visitor use and experience because, according to the Organic Act, enjoyment cannot be impaired in the same way an action can impair park resources and values.

SOILS

Methodology and Assumptions

Potential impacts to soils are assessed based on the extent of disturbance to natural undisturbed and previously disturbed soils, the potential for soil erosion resulting from disturbance, and limitations associated with the soils. Analysis of possible impacts to soil resources was based on inspection of the resource within the project area, review of existing literature and maps, and information obtained from the NPS and other agencies.

Study Area

The geographic study area for soils includes the existing footprint of the overlooks associated with Skyline Drive. In some instances, at those overlooks where reconstruction of retaining walls is necessary, construction activities would extend beyond the original footprint at the base of the existing retaining walls. Staging areas for heavy equipment during construction would also be within the potential area of effect for soils.

Impact Thresholds

The following thresholds were used to determine the magnitude of effects on soil resources:

Negligible – Soils would not be impacted or the impacts to soils would be below or at the lower levels of detection. Any impacts to soils would be slight.

Minor – Impacts to soils would be detectable and within a small area. Mitigation would be needed to offset adverse effects, would be relatively simple to implement, and would likely be successful.

Moderate – Impacts on soil would be readily apparent and would result in a change to the soil character over a relatively wide area. Mitigation measures would be necessary to offset adverse impacts and would likely be successful.

Major – Impacts on soil would be readily apparent and would substantially change the character of the soils over a large area both in and out of the park. Mitigation measures necessary to offset adverse effects would be needed and extensive, and their success would not be guaranteed.

Duration – Short-term impacts occur during all or part of alternative implementation; long-term impacts extend beyond implementation of the alternative.

Impacts of Alternative A – No Action Alternative

Analysis. Under the no action alternative, drainage deficiencies at the overlooks would not be corrected and during high flow events, uncontrolled runoff from the nearby road and parking areas and surrounding uplands could result in soil erosion along and downslope of the overlooks. This erosion would cause long-term minor adverse impacts to soils within the project area.

Cumulative Impacts. Roadway improvement projects that would be implemented by the NPS and FHWA along and within the vicinity of Skyline Drive, such as repairs to the Skyline Drive road and guardwalls; repairs to the Byrd Visitor Center Access Road; proposed road repairs to the stables, wastewater treatment plant, and housing area at the Skyland Area; and proposed repairs to the Big Meadows Old Campground access road, could result in localized soil compaction and disturbance during construction activities. Drainages could also be altered during construction resulting in increased erosion related to runoff during storm events, especially in the steeper portions of the park. With the implementation of mitigation measures, impacts to soils would be long-term, minor and adverse. These impacts, in combination with the long-term minor adverse impacts of the no action alternative, would result in long-term minor adverse cumulative impacts to soils.

Conclusion. Implementation of the no action alternative would result in long-term minor adverse impacts to soils related to existing drainage deficiencies. Long-term minor adverse cumulative impacts would occur in the vicinity of the overlooks along Skyline Drive. There would be no impairment of soil resources under the no action alternative.

Impacts of Alternative B – Rehabilitation with Preservation and Rehabilitation of Historic Features

Analysis. Alternative B would entail the rehabilitation of 49 overlooks associated with Skyline Drive based on historic design. During all construction activities associated with this alternative, mitigation measures (detailed in the “Alternatives” chapter) would be implemented to minimize adverse impacts to soils.

Removing and revegetating six non-historic/informal pull-offs along Skyline Drive would have long-term minor beneficial impacts to soils as there would be less stormwater runoff from these areas, decreasing the potential for erosion.

Activities that could impact soils at those overlooks requiring total reconstruction include rebuilding failing fill slopes and retaining walls and reestablishing appropriate drainage through existing historic walls, where possible. Localized soil compaction and disturbance that goes beyond the original footprint at the base of the existing retaining walls could occur during construction activities resulting in soil compaction and disturbance. These impacts would be short-term minor adverse because the impacted area could be restored by tilling and reseeding the impacted area. Establishing appropriate drainages at the overlooks by adding drainage inlets, re-establishing weep drains, installing riprap at outfalls, and restoring original drainage through the retaining and guardwalls would reduce current and potential soil erosion occurring downslope of the overlooks and result in long-term minor beneficial impacts to soils.

Partial reconstruction required at some of the overlooks could impact soils due to partial rebuilding of failing fill slopes and retaining walls and re-establishing appropriate drainage through historic walls, where possible; however, the degree and extent of adverse impacts would be less than those impacts associated with total reconstruction. Localized long-term minor adverse impacts to site-specific areas beyond the original footprint would occur as a result of some soil disturbance and compaction from repairing fill slopes. Appropriate drainages would be established in the same manner as at those overlooks requiring total reconstruction, and would also result in long-term minor beneficial impacts.

There would be no impacts to soils as result of repaving the parking areas at the overlooks, including repaving and reconfiguring the parking area at Dark Hollow Overlook. All work to the parking areas would be kept within the same footprint of the original parking area, and all soils within these areas have been previously disturbed and compacted. Reconfiguring the Limberlost parking area would include expanding beyond the original footprint of the parking area onto previously undisturbed soils. These soils outside the original footprint would be paved resulting in long-term minor adverse impacts to previously undisturbed soils.

Cumulative Impacts. Roadway improvement projects that would be implemented by the NPS and FHWA along and within the vicinity of Skyline Drive such as repairs to the Byrd Visitor Center Access Road; proposed road repairs to the stables, wastewater treatment plant, housing area at the Skyland Area, proposed repairs to the Big Meadows Old Campground access road, and spot repairs to Skyline Drive could result in localized soil compaction and disturbance during construction activities. Drainages also could be altered during construction resulting in increased erosion related to runoff during storm events, especially in the steeper portions of the park. With the implementation of mitigation measures, short-term adverse impacts to soils would be minor. These impacts, in combination with the short-term and long-term minor adverse impacts and long-term beneficial impacts of alternative B would result in short-term minor adverse cumulative impacts to soils.

Conclusion. Implementation of alternative B would result in short-term and long-term minor adverse impacts to soils from the increased potential for erosion, compaction, paving, and disturbance of soils resulting from construction activities. Long-term minor beneficial impacts at both the overlooks and along sections of Skyline Drive would result from improved drainage, reduced erosion and by rehabilitating six non-historic/informal pull-offs along Skyline Drive. Short-term minor adverse cumulative impacts would occur in the vicinity of Skyline Drive. There would be no impairment of soil resources under alternative B.

Impacts of Alternative C – Rehabilitation Based on Engineering Study Recommendations

Analysis. Alternative B would entail the rehabilitation of 49 overlooks associated with Skyline Drive based on engineering recommendations presented in the 2001 Engineering Study developed by the FHWA. As with alternative B, mitigation measures detailed in the “Alternatives” chapter would be implemented during all construction activities to minimize adverse impacts to soils.

Removing and revegetating six non-historic/informal pull-offs would have long-term minor beneficial impacts to soils as there would be less stormwater runoff from these areas, decreasing the potential for erosion.

Where overlooks would require total reconstruction, activities that could impact soils include rebuilding failing fill slopes and retaining walls and reestablishing appropriate drainage through existing historic walls, where possible. Localized soil compaction and disturbance could occur during construction activities that would go beyond the original footprint at the base of the existing retaining walls, which could result in soil compaction and disturbance. The resulting impacts would be considered a short-term minor adverse impact because the impacted area could be restored by tilling and reseeding the impacted area. Establishing appropriate drainages at the overlooks by adding drainage inlets, re-establishing weep drains, installing riprap at outfalls, and restoring original drainage through the guardwalls and retaining walls would reduce current and potential soil erosion occurring downslope of the overlooks, having long-term minor beneficial impacts to soils.

Partial reconstruction required at some of the overlooks could impact soils due to partial rebuilding of failing fill slopes and retaining walls and re-establishing appropriate drainage through historic walls, where possible; however, the degree and extent of adverse impacts would be less than those impacts associated with total reconstruction. Localized long-term minor adverse impacts to site-specific areas beyond the original footprint would occur as a result of some soil disturbance and compaction from repairing fill slopes. Appropriate drainages would be established in the same manner as at those overlooks requiring total reconstruction and would also result in long-term minor beneficial impacts.

No impacts to soils would result from repaving the parking areas at the overlooks, including repaving and reconfiguring the parking area at Dark Hollow Overlook. All work to the parking areas would be kept within the existing footprint of the original parking area, and all soils within these areas have been previously disturbed and compacted. Reconfiguring the Limberlost parking area would include expanding beyond the original footprint of the parking area onto previously undisturbed soils. These soils outside the original footprint would be paved over, which would result in long-term minor adverse impacts to previously undisturbed soils.

Cumulative Impacts. Roadway improvement projects that would be implemented by the NPS and FHWA along and within the vicinity of Skyline Drive, such as repairs to the Byrd Visitor Center Access Road; proposed road repairs to the stables, wastewater treatment plant, housing area at the Skyland Area, proposed repairs to the Big Meadows Old Campground access road, and spot repairs to Skyline Drive could result in localized soil compaction and disturbance during construction activities. Drainages could also be altered during construction resulting in increased erosion related to runoff during storm events, especially in the steeper portions of the park. With the implementation of mitigation measures, these disturbances would result in long-term minor adverse impacts to park soils. These impacts, in combination with the long-term minor adverse impacts and long-term beneficial impacts of alternative B, would result in short-term minor adverse cumulative impacts to soils.

Conclusion. Implementation of alternative C would result in short-term and long-term minor adverse impacts to soils from the increased potential for erosion, compaction, paving, and disturbance of soils resulting from construction activities. Long-term minor beneficial impacts at both the overlooks and along sections of Skyline Drive would result from improved drainage, reduced erosion and by rehabilitating six non-historic/informal pull-offs along Skyline Drive. Short-term minor adverse cumulative impacts would occur in the vicinity of Skyline Drive. There would be no impairment of soil resources under alternative C.

THREATENED, ENDANGERED, AND SPECIES OF SPECIAL CONCERN

Methodology and Assumptions

The Endangered Species Act (16 USC 1531 et seq.) mandates that all federal agencies consider the potential effects of their actions on species listed as threatened or endangered. Section 7 of the

Endangered Species Act requires federal agencies that fund, authorize, or carry out an action to ensure that their action is not likely to jeopardize the continued existence of any threatened or endangered species (including plant species) or result in the destruction or adverse modification of designated critical habitats. If it is determined that an action may adversely affect a federally listed species, consultation with the USFWS is required to ensure minimization of potential adverse impacts to the species or its designated critical habitat. In addition, the NPS *Management Policies* state that the NPS will inventory, monitor, and manage all state and locally listed species in a manner similar to its treatment of federally listed species, to the greatest extent possible.

Study Area

The geographic study area for any federal- or state-listed species that could be impacted by the proposed actions includes the existing footprint of the overlooks associated with Skyline Drive, and any habitat in the vicinity of the project area.

Impact Thresholds

The following thresholds were used to determine the magnitude of effects on threatened, endangered, and other special status species:

Negligible – The action could result in a change to a population or individuals of a species or designated critical habitat, but the change would be so small that it would not be of any measurable or perceptible consequence and would be well within natural variability. This impact intensity equates to a USFWS “no effect” or “may affect, not likely to adversely affect” determination.

Minor – The action could result in a change to a population or individuals of a species or designated critical habitat. The change would be measurable, but small and localized and not outside the range of natural variability. Mitigation measures, if needed to offset the adverse effects, would be simple and successful. This impact intensity equates to a USFWS “may affect, not likely to adversely affect” or “may affect, likely to adversely affect” determination.

Moderate – Impacts on special-status species, their habitats, or the natural processes sustaining them would be detectable and occur over a large area. Breeding animals of concern are present; animals are present during particularly vulnerable life-stages such as migration or juvenile stages; mortality or interference with activities necessary for survival can be expected on an occasional basis, but is not expected to threaten the continued existence of the species in the park unit. Mitigation measures, if needed to offset adverse effects, would be extensive and likely successful. This impact intensity equates to a USFWS “may affect, likely to adversely affect” determination.

Major – The action would result in a noticeable effect to viability of a population or individuals of a species or resource or designated critical habitat. Impacts on a special-status species, critical habitat, or the natural processes sustaining them would be detectable, both in and out of the park. Loss of habitat might affect the viability of at least some special-status species. Extensive mitigation measures would be needed to offset any adverse effects and their success would not be guaranteed. This impact intensity equates to a USFWS “may affect, likely to jeopardize the continued existence of a species or adversely modify critical habitat for a species” determination.

Duration – Short-term impacts are those that occur during implementation of the alternative. Long-term effects extend beyond implementation, continuing to effect population, community, or designated critical habitat recovery.

Impacts of Alternative A – No Action Alternative

Analysis. In the no action alternative, overlook maintenance and repair would continue to occur on an as-needed basis. There would be no disturbance of habitat adjacent to the overlooks because maintenance activities would generally occur within the confines of the overlook footprint and result in negligible impacts. However, in the event of emergency repairs that might extend beyond the footprint of an overlook, the NPS would employ mitigation measures to ensure the protection of its natural and biological resources, as well as mitigation that specifically addresses the Shenandoah salamander and its required habitat, and any other state listed or rare species that may occur in the general vicinity. Such mitigations would include surveying the project area for the listed species by a NPS biologist prior to the onset of construction. Any areas known or found to contain listed or rare species would be delineated and protected from construction activities. In addition, construction workers would be provided with a photograph of the Shenandoah salamander and instructed to stop all work and notify the NPS immediately if a Shenandoah salamander is encountered at the site. As a result, short-term and long-term negligible adverse impacts could occur to the Shenandoah salamander and other listed or rare species within the park.

Cumulative Impacts. Due to the localized nature of the salamander's habitat, none of the current or proposed future facility or roadway improvement projects within the park would occur near this habitat and would not impact the Shenandoah salamander. As a result, there would be no adverse or beneficial cumulative impacts to the Shenandoah salamander. There may be instances where a state-listed species occurs within the general vicinity of one or several of the proposed future action sites. However, prior to initiating any of these projects, qualified park staff would survey the area for such species. If a state-listed species were discovered, the park would initiate mitigation measures prior to construction that would minimize any adverse impacts that could occur to these species. As a result, there would be the potential for short-term negligible adverse impacts to state-listed species. These impacts in combination with the short-term and long-term negligible adverse impacts of the no action alternative would result in long-term negligible adverse cumulative impacts to any state-listed species found within the general vicinity of the construction associated with the current or future facilities or other park roadway improvement projects.

Conclusion. Implementation of the no action alternative would result in long-term negligible adverse impacts and cumulative impacts to the federally endangered Shenandoah salamander and other listed or rare species related to ongoing overlook maintenance and emergency repairs. There would be no adverse or beneficial cumulative impacts related to the Shenandoah salamander; however, there could be short-term negligible adverse cumulative impacts to any state-listed species found within the general vicinity of the construction. No impairment of special status species would occur under the no action alternative.

Impacts of Alternative B – Rehabilitation with Preservation and Rehabilitation of Historic Features

Analysis. Under alternative B, construction activities that would occur during the rehabilitation of the park's overlooks and the subsequent operation of these facilities would not likely adversely affect the Shenandoah salamander or any other state-listed or rare species found within the park.

Information taken from the USFWS *Shenandoah Salamander (Plethodon shenandoah) Recovery Plan* (USFWS 1994) indicates most areas where the Shenandoah salamander is known to exist are located at sufficient distance (greater than 1,000 feet) from the overlooks to prevent any direct impacts on the species from construction activities. Any indirect impacts resulting from construction activities such as increased erosion that could affect the salamander or its habitat would be negated through project mitigation as outlined in the "Alternatives" chapter.

The salamander is known to occur in two small areas and there is potential habitat in several areas adjacent to Skyline Drive, south of the Stony Man Overlook. However, rehabilitation activities in these areas would not likely adversely affect the salamander, its known habitat, or potential habitat for the following reasons:

- There is no known habitat suitable for the Shenandoah salamander near any of the overlooks. The areas below the overlooks have been cleared of trees to a distance of 50 to 200 yards to maintain historic vistas, creating sun-drenched grassy areas with few scattered trees.
- The vast majority of construction activities associated with the overlooks would remain within its original footprint. If it becomes necessary for construction to go outside the footprint, the NPS would survey for the presence of threatened and endangered and state listed species prior to starting any construction activities. Should any species be found, proper mitigation measures would be implemented or the area would be avoided.
- All mitigations previously mentioned would be enacted.
- There are currently adequate staging areas where construction equipment could be parked and stored, which would not impact the natural or biological resources of the park.
- According to the USFWS *Shenandoah Salamander (Plethodon shenandoah) Recovery Plan* (USFWS 1994), neither the existence of Skyline Drive nor the overlooks have attributed to the decline of the salamander or its habitat.

In addition, during all construction activities, the NPS would employ mitigation measures to ensure the protection of its natural and biological resources, as well as mitigation that specifically addresses the Shenandoah salamander and its required habitat, and any other state listed or state rare species that may occur in the general vicinity. Such mitigations would include surveying the entire project area by an NPS biologist prior to the onset of construction for the presence of listed or rare species. Any areas known or found to contain listed or rare species would be delineated and protected from construction activities. In addition, construction workers would be provided with a photograph of the Shenandoah salamander and instructed to stop all work and notify the NPS immediately if a Shenandoah salamander is encountered at the site. As a result, short-term and long-term negligible adverse impacts could occur to the Shenandoah salamander and other state-listed or rare species within the park.

Cumulative Impacts. Due to the localized nature of the salamander's habitat, none of the current or proposed future facility or roadway improvement projects within the park would occur near this habitat and would not likely adversely affect the Shenandoah salamander. As a result, there would be no adverse or beneficial cumulative impacts to the Shenandoah salamander. There may be instances where a state-listed species occurs within the general vicinity of one or several of the proposed future action sites. However, prior to initiating any of these projects, qualified park staff would survey the area for such species. If a state-listed species were discovered, the park would initiate mitigation measures prior to construction that would minimize any adverse impacts that could occur to these species. As a result, there would be the potential for short-term negligible adverse impacts to state-listed species. These impacts in combination with the short-term and long-term negligible adverse impacts of alternative B would result in short-term negligible adverse cumulative impacts to any state-listed species found within the general vicinity of the construction associated with the current or future facilities or other park roadway improvement projects.

Conclusion. Implementation of alternative B would result in short- and long-term negligible adverse impacts to the federally endangered Shenandoah salamander and other state-listed or rare species related to the rehabilitation of the park's overlooks. There would be no adverse or beneficial cumulative impacts directly related to the Shenandoah salamander; however, short-term negligible adverse cumulative impacts to any state-listed species found within the general vicinity of the construction could occur. No impairment of special status species would occur under alternative B.

Impacts of Alternative C – Rehabilitation Based on Engineering Study Recommendations

Analysis. For the same reasons as outlined under alternative B, construction activities involved during the rehabilitation of the park's overlooks and the subsequent operation of these facilities under alternative B would not affect the Shenandoah salamander or any other state-listed or rare species or their required habitat found within the park. During all constructions activities, the NPS would employ mitigation

measures to ensure the protection of its natural and biological resources, as well as mitigation that specifically addresses the Shenandoah salamander and its required habitat, and any other state listed or state rare species that may occur in the general vicinity. Such mitigations would include an NPS biologist surveying the entire project area prior to the onset of construction for the presence of listed or rare species. Any areas known or found to contain listed or rare species would be delineated and protected from construction activities. In addition, construction workers would be provided with a photograph of the Shenandoah salamander and instructed to stop all work and notify the NPS immediately if a Shenandoah salamander is encountered at the site. As a result, short-term and long-term negligible adverse impacts could occur to the Shenandoah salamander and other listed or rare species within the park.

Under this alternative, rehabilitation of the overlooks would not affect the Shenandoah salamander. There is no known habitat near any of the overlooks. There would be no loss of forest cover because the areas below the overlooks have been cleared of trees to a distance of 50 to 200 yards to maintain historic vistas, creating sun-drenched grassy areas with a few scattered trees that have resulted in unsuitable salamander habitat. In addition, all mitigation listed in alternative B would be carried out during the overlook rehabilitation efforts to protect the park's natural and biological resources.

Based on the analysis above, all construction activities associated with the rehabilitation of the park's overlooks according to engineering recommendations would result in short-term and long-term negligible adverse impacts to the Shenandoah salamander and other listed or rare species within the park.

Cumulative Impacts. Due to the localized nature of the salamander's habitat, none of the current or proposed future facility or roadway improvement projects within the park would occur near this habitat and would not impact the Shenandoah salamander. As a result, there would be no adverse or beneficial cumulative impacts to the Shenandoah salamander. There may be instances where a state-listed species occurs within the general vicinity of one or several of the current or proposed future facilities or other park roadway improvement project sites. However, prior to initiating any of these projects, qualified park staff would survey the area for such species. If a state-listed species were discovered, the park would initiate mitigation measures prior to construction that would eliminate or minimize any adverse impacts that could occur to these species. As a result, there would be the potential for short-term negligible adverse impacts to state-listed species. These impacts in combination with the short-term and long-term negligible impacts of alternative B would result in short-term negligible adverse cumulative impacts to any state-listed species found within the general vicinity of the construction associated with the current or future facilities or other park roadway improvement projects.

Conclusion. Implementation of alternative C would result in short- and long-term negligible adverse impacts to the federally endangered Shenandoah salamander and other state-listed or rare species related to the rehabilitation of the park's overlooks based on engineering recommendations. There would be no adverse or beneficial cumulative impacts directly related to the Shenandoah salamander; however, there could be short-term negligible adverse cumulative impacts to any state-listed species found within the general vicinity of the construction. No impairment of special status species would occur under alternative A.

CULTURAL LANDSCAPES

The analyses of effects on cultural landscapes that are presented in this section respond to the requirements of both NEPA and Section 106 of the NHPA. In accordance with the Advisory Council's regulations implementing Section 106 (36 CFR Part 800, *Protection of Historic Properties*), impacts on cultural resources were identified and evaluated by (1) determining the Area of Potential Effects (APE); (2) identifying cultural resources present in the APE that are either listed in or eligible to be listed in the National Register (e.g., historic properties); (3) applying the criteria of adverse effect to affected historic properties; and (4) considering ways to avoid, minimize, or mitigate adverse effects.

Under the implementing regulations for Section 106, a determination of either *adverse effect* or *no adverse effect* must also be made for affected historic properties. 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, diminishing the integrity of the resource's location, design, setting, materials, workmanship, feeling, or association). Adverse effects also include reasonably foreseeable effects caused by the proposal that would occur later in time, be farther removed in distance, or be cumulative (36 CFR 800.5). A determination of *no adverse effect* means there is either no effect or that the effect would not diminish, in any way, the characteristics of the cultural resource that qualify it for inclusion in the National Register.

CEQ regulations and the NPS *Conservation Planning, Environmental Impact Analysis and Decision-making* (Director's Order #12) also call for a discussion of the appropriateness of mitigation, as well as an analysis of how effective the mitigation would be in reducing the intensity of a potential impact, e.g. reducing the intensity of an impact from major to moderate or minor. Any resultant reduction in intensity of impact due to mitigation, however, is an estimate of the effectiveness of mitigation under NEPA only. Cultural resources are non-renewable resources and adverse effects generally consume, diminish, or destroy the original historic materials or form, resulting in a loss in the integrity of the resource that can never be recovered. Therefore, although actions determined to have an adverse effect under Section 106 may be mitigated, the effect remains adverse.

The NPS guidance for evaluating impacts (*Director's Order #12: Conservation Planning, Environmental Impact Analysis, and Decision Making*) (NPS 2001) requires that impact assessment be scientific, accurate, and quantified to the extent possible. For cultural resources, it is seldom possible to measure impacts in quantifiable terms; therefore impact thresholds must rely heavily on the professional judgment of resource experts.

Methodology and Assumptions

Efforts to identify cultural landscape elements included a review of existing information provided by the park, supplemented by interviews with park staff. For the assessment of potential impacts to cultural landscapes, the principal sources reviewed were the Skyline Drive Historic District National Register nomination form (Maddex et al. 1999), two increases to the historic district added in September 1997 (Maddex et al. 1999) and December 2003 (Maddex et al. 1999), and two histories published by the park on the Skyland resort (Engle 2003) and the CCC construction activities in the park and along Skyline Drive (Engle 1999). In addition, a 1998 issue of *Cultural Resource Management* magazine that focused on Shenandoah National Park was also accessed for information on cultural resources and landscapes at the park. Survey file information in the collections of the Virginia Department of Historic Resources, the state historic preservation office, was also consulted (McClelland 1998).

In addition to the cultural landscape's character-defining features outlined in the Affected Environment chapter (See Page 33), distinguishing design characteristics of the Skyline Drive cultural landscape include the roadway's curvilinear alignment; the adjacent, gently rounded or flattened, roadway slopes planted with native trees and shrubs that blend the drive into its surrounding topography and that contribute to the road's scenic qualities; the frequent parking overlooks that provide a progression of panoramic views and access to Appalachian Trail and spur trails snaking throughout the park; and waysides developed to provide amenities for picnickers, campers, and other park users (McClelland 1998).

Study Area

The park's principal component landscape is comprised of the Skyline Drive Historic District. The Skyline Drive Historic District includes the 105-mile, ridge-top roadway from Front Royal to Rockfish Gap and its adjoining lodges, cabin camps, gas stations, riding stables, overlooks, wayside stations, picnic areas, and other developed areas. The district contains over 33,000 acres of land and more than 400 buildings, structures, and objects that are considered contributing elements.

Impact Thresholds

In order for a cultural landscape to be listed on the National Register of Historic Places, it must possess significance (the meaning or value ascribed to the landscape) and have integrity of those features necessary to convey its significance. Character-defining features of a cultural landscape may include spatial organization and land patterns; topography; vegetation; circulation patterns; water features; and structures/buildings, site furnishings, and objects (see *The Secretary of the Interior's Standards for the Treatment of Historic Properties and the Guidelines for the Treatment of Cultural Landscapes*, 1996). For purposes of analyzing potential impacts to cultural landscapes, the thresholds of change for the intensity of an impact are defined as follows:

- Negligible:* The impact is at the lowest level of detection with neither adverse nor beneficial consequences. For purposes of section 106, the determination of effect would be *no adverse effect*.
- Minor:* Alteration of a pattern(s) or feature(s) of the cultural landscape listed on or eligible for the National Register of Historic Places would not diminish the integrity of the overall integrity of the landscape. For purposes of Section 106, the determination of effect would be *no adverse effect*.
- Moderate:* The impact would alter pattern(s) or a character-defining feature(s) of the cultural landscape and would diminish the overall integrity of the landscape. For purposes of Section 106, the determination of effect would be *adverse effect*. A memorandum of agreement is executed among the National Park Service and applicable state or tribal historic preservation officer and, if necessary, the Advisory Council on Historic Preservation in accordance with 36 CFR 800.6(b). Measures identified in the MOA to minimize or mitigate adverse impacts reduce the intensity of impact under NEPA from major to moderate.
- Major:* The impact would alter pattern(s) or a character-defining feature(s) of the cultural landscape and would diminish the overall integrity of the landscape. For purposes of Section 106, the determination of effect would be *adverse effect*. Measures to minimize or mitigate adverse impacts cannot be agreed upon and the National Park Service and applicable state or tribal historic preservation officer and/or Advisory Council are unable to negotiate and execute a memorandum of agreement in accordance with 36 CFR 800.6(b).
- Duration:* Short-term impacts would last for the duration of construction activities associated with the proposed action; long-term impacts would last beyond the construction activities.

Impacts of the Alternative A – No Action Alternative

Analysis. The no action alternative would continue current conditions and result in further deterioration of the overlooks, including stone guardwalls and retaining walls, all contributing elements to the drive's cultural landscape and character-defining features of the cultural landscape. Ultimately, the no action alternative would entail occasional, temporary closure of the overlooks for repairs.

As a result of the continued deterioration of the overlooks, selected overlooks could be closed to traffic and other park users for short-term periods during repairs. Short-term closures would most likely occur at overlooks in need of partial and total reconstruction, although they might also occur at overlooks that require spot repairs. While such a temporary closure would alter the character of the park by temporarily impacting the landscape's circulation patterns and the overlooks that comprise character-defining features of the landscape, the short-term duration of these closures would not significantly alter the character-defining features of the Skyline Drive cultural landscape. These temporary closures would result in short-term minor adverse impacts.

The continued deterioration of the historic elements of the overlooks under the no action alternative would result in long-term minor adverse impacts. However, the overall integrity of the cultural landscape of Skyline Drive would not be diminished. The no action alternative would not impact the cultural landscape's spatial organization and land patterns or other elements of its character-defining features.

Cumulative Impacts. Due to the localized nature of current and future NPS facility and NPS and FHWA roadway improvement projects, short-term negligible impacts on the Skyline Drive cultural landscape are expected. This short-term negligible impact in combination with the short- and long-term minor adverse impacts of the no action alternative would result in short- and long-term minor adverse cumulative impacts to the Skyline Drive cultural landscape.

Conclusion. Implementation of the no action alternative would result in short-term minor adverse impacts on the cultural landscape due to the continued deterioration of the Skyline Drive overlooks and the periodic closures required for their repair. Short- and long-term minor adverse cumulative impacts would occur. No impairment of the park's cultural landscape would occur under the no action alternative.

Impacts of Alternative B – Rehabilitation with Preservation and Rehabilitation of Historic Features

Analysis. Alternative B would entail rehabilitating 49 overlooks while preserving the historic characteristics of the overlooks following the Secretary of the Interior's *Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes*. These improvements would impact elements of the landscape's spatial organization, land patterns, buildings and structures, vegetation, and circulation. The historic character of the road and overlooks would be preserved by retaining and, where necessary, repairing or replacing significant character-defining features such as stone curbing, stone-paved drainage structures, walkways, stone retaining walls, and guardwalls.

Stone masonry guardwalls at overlooks would be rehabilitated to re-establish their original 22-inch height and may necessitate the addition of a concrete footing under selected walls. Reassembled walls would utilize similar stone patterning and mortar joint widths as the original walls. Retaining walls at overlooks would be rehabilitated similar to the guardwalls. Stone curbing at overlooks would be reset while gravel sidewalks would be resurfaced to match the original gravel finish appearance or restored to their original gravel finish where historic sidewalks have been previously replaced with asphalt surfaces. Wooden guiderails would be restored at the overlooks in their historic locations. Any new or replacement inlets needed to repair drainage at the overlooks would be similar in design to the existing historic structures. Informal pull-offs would also be removed and revegetated in order to return the drive to its historic appearance. During these construction activities, individual overlooks may be closed to visitor use. After the completion of some the construction activities, the overlooks would be returned to use and would continue to reflect their historic appearance incorporating the design intent of the park's original planners.

The proposed rehabilitation of the overlooks would result in temporary closings of the individual overlooks during construction activities. Short-term closures would be most likely to occur at overlooks in need of partial and total reconstruction where construction work could be extensive. Although they could also occur during spot repairs, the closures would most likely be of shorter duration. While such a temporary closure would alter the character of the spatial organization, land patterns, and circulation networks of the landscape by temporarily impacting the landscape's roadway and overlooks that comprise character-defining features of the landscape, the short-term duration of these closures would not significantly alter these character-defining features of the Skyline Drive cultural landscape. These temporary closures would result in short-term minor adverse impacts (no adverse effect under Section 106).

Upon completion of the construction activities under alternative B, the preservation and rehabilitation of the overlooks' historic features through rehabilitation and replacement of features such as stone retaining walls and guardwalls would closely return Skyline Drive to its historic appearance and use following the Secretary of the Interior's standards. While these undertakings would result in some alterations and/or additions to the landscape's character-defining elements, the changes would maintain the historic character of the original CCC-built overlooks and be consistent with the Secretary of the Interior's

standards for rehabilitation. These standards acknowledge that alterations or additions to a landscape often are required in order to meet continuing or new uses while retaining the landscape's historic character. The outlined rehabilitation would not significantly alter individual elements contributing to the Skyline Drive cultural landscape or the overall landscape. These activities would constitute a long-term moderate beneficial impact (no adverse effect under Section 106) by maintaining and preserving the historic function and appearance of the roadway and its overlooks.

Cumulative Effects. Due to the localized nature of current and future NPS facility and NPS and FHWA roadway improvement projects, short-term negligible impacts on the Skyline Drive cultural landscape are expected. This short-term negligible adverse impact in combination with the short-term moderate adverse and long-term moderate beneficial impacts of alternative B would result in long-term moderate beneficial cumulative impacts to the Skyline Drive cultural landscape.

Conclusion. Rehabilitation of the overlooks following the Secretary of the Interior's standards and guidelines would result in short-term minor adverse impacts (no adverse effect under Section 106) during temporary closures related to construction and long-term moderate beneficial impacts (no adverse effect under Section 106) due to the maintenance and preservation of the overlooks' historic function and appearance. Long-term moderate beneficial cumulative impacts to the Skyline Drive cultural landscape would occur in alternative B. No impairment of the park's cultural landscape would occur under alternative B.

Impacts of Alternative C – Rehabilitation Based on Engineering Study Recommendations

Analysis. Alternative C would entail the rehabilitation of 49 Skyline Drive overlooks. Although alternative C would address deterioration of the overlooks as outlined in alternative B, the rehabilitation of some of the landscape's character-defining features would not retain all of the feature's historic elements. For example, many of the remaining historic stone guardwalls would be removed or replaced with concrete-core stone walls. These undertakings would impact elements of the cultural landscape's spatial organization, land patterns, buildings and structures, vegetation, and circulation as outlined in alternative B. However, the Secretary of the Interior's standards and guidelines acknowledge the need to alter or add to a cultural landscape to meet new or continuing uses while retaining the landscape's historic character.

The proposed rehabilitation of the overlooks would result in temporary closures of the individual overlooks during construction activities. Short-term closures would be most likely to occur at overlooks in need of partial and total reconstruction where construction work would be extensive and at locations featuring the removal or rebuilding of the remaining historic stone guardwalls at overlooks along Skyline Drive. Although they could also occur related to spot repairs, the closures would most likely be of shorter duration. While such a temporary closure would alter the character of the park by temporarily impacting the landscape's circulation patterns and the overlooks that comprise character-defining features of the landscape, the short-term duration of the closures' impacts would not significantly alter the character-defining features or the historic character of the Skyline Drive cultural landscape. These temporary closures would result in short-term minor adverse impacts (no adverse effect under Section 106).

Similar to alternative B, completion of the improvements proposed under alternative C would bring the overlooks into good condition and enhance safety at overlooks along the roadway. These improvements would alter characteristics of the cultural landscape's spatial organization, land patterns, buildings and structures, vegetation, and circulation network; however, these activities would retain the landscape's historic character, although not to the degree of retention as alternative B. Reconstruction of overlooks under alternative B would not necessarily follow historic design elements. For example, the concrete core stone guardwalls would not necessarily be faced with the same stone as under alternative B, where original materials would be reused for repairs as much as possible. The guardwalls would not be an accurate representation of the original CCC construction. Generally, the improvements would not severely diminish the overall integrity of the Skyline Drive cultural landscape, and are thus expected to result in long-term minor adverse impacts (no adverse effect under Section 106) to the cultural landscape.

Cumulative Effects. Due to the localized nature of current and future NPS facility and NPS and FHWA roadway improvement projects, short-term negligible impacts on the Skyline Drive cultural landscape are expected. This short-term negligible impact in combination with the short-term and long-term minor adverse impacts of alternative C would result in long-term minor adverse cumulative impacts to the Skyline Drive cultural landscape.

Conclusion. Rehabilitation of the overlooks according to the 2001 Engineering Study recommendations would result in short-term and long-term minor adverse impacts (no adverse effect under Section 106) to the cultural landscape due to temporary road closures and some changes to the landscape's historic character. Long-term minor adverse cumulative impacts to the Skyline Drive cultural landscape would occur under alternative C. No impairment of the Skyline Drive cultural landscape would occur under alternative C.

VISITOR USE AND EXPERIENCE

Methodology and Assumptions

To determine impacts on visitor use and experience, two aspects were considered: (1) the road itself as part of the visitor experience and (2) the road as a means to access other park resources and recreational sites.

Study Area

The study area for visitor experience includes the area within the footprint of each overlook, the visitor sites accessed from the overlooks, overlooks where visitors will enjoy scenic vistas, and the viewshed of the 49 overlooks along Skyline Drive proposed for rehabilitation.

Impact Thresholds

The following thresholds were defined:

Negligible – Visitors would likely be unaware of impacts associated with implementation of the alternative. There would be no noticeable change in visitor use and experience or in any defined indicators of visitor satisfaction or behavior.

Minor – Changes in visitor use and/or experience would be slight and detectable, but would not appreciably limit or enhance critical characteristics of the visitor experience. Visitor satisfaction would remain stable.

Moderate – Few critical characteristics of the desired visitor experience would change. The number of participants engaging in a specified activity would be altered. Some visitors who desire their continued use and enjoyment of the activity/visitor experience might be required to pursue their choices in other available local or regional areas. Visitor satisfaction would begin to either decline or increase.

Major – Multiple critical characteristics of the desired visitor experience would change and/or the number of participants engaging in an activity would be greatly reduced or increased. Visitors who desire their continued use and enjoyment of the activity/visitor experience would be required to pursue their choices in other available local or regional areas. Visitor satisfaction would markedly decline or increase.

Duration – Short-term impacts occur during all or part of alternative implementation; long-term impacts extend beyond implementation of the alternative.

Impacts of Alternative A – No Action Alternative

Analysis. Under the no action alternative, access to the overlooks found along Skyline Drive would remain the same. The park would continue to implement selected repairs to the overlooks as funding allows. However, the overlooks along Skyline Drive would continue to deteriorate. As the overlooks deteriorate, their overall aesthetic quality would degrade, which could adversely affect the overall

experience of some visitors to the park. The lack of scheduled maintenance and the continual degradation of the park's overlooks would result in long-term minor adverse impacts to visitor use and experience under the no action alternative.

Cumulative Impacts. NPS projects within Shenandoah National Park such as the new comfort station at Byrd Visitor Center, the interior renovations and exhibits at Byrd Visitor Center, and NPS and FHWA roadway improvement projects in the vicinity of Skyline Drive all would have long-term beneficial impacts aimed at improving visitor use and experience by improving the park's facilities and overall interpretative capabilities. However, roadway improvement projects could potentially have minor adverse impacts to Skyline Drive with increased truck and/or other construction equipment going to and from the sites. In addition, there could potentially be impacts to the ingress and egress of these roads onto Skyline Drive from construction activities, which could cause short-term minor adverse impacts to those using Skyline Drive.

These impacts in combination with the long-term minor adverse impacts of the no action alternative would result in long-term minor adverse cumulative impacts and long-term minor beneficial cumulative impacts to visitor use and experience.

Conclusion. Implementation of the no action alternative would result in long-term minor adverse impacts to visitor use and experience due to the continued deterioration of the park's overlooks. Long-term minor cumulative impacts related to traffic delays would occur but long-term minor beneficial cumulative impacts would result from the road and facility improvements.

Impacts of Alternative B – Rehabilitation with Preservation and Rehabilitation of Historic Features

Analysis. Alternative B would call for the rehabilitation of 49 overlooks located along Skyline Drive based on historic design. Activities associated with the rehabilitation of the park's historic overlooks that could potentially impact visitor use and experience includes the temporary closure of those overlooks requiring total or partial reconstruction and disturbance and noise associated with all rehabilitation activities. To assure visitor safety, overlooks that require total or partial reconstruction would be closed to the public while construction activities are taking place. Those overlooks requiring total reconstruction could be closed for up to two years, while those overlooks requiring partial reconstruction could be closed for up to one year or longer depending upon the extent of reconstruction. Since only one or two of the 69 overlooks would be closed at any one time, closing these overlooks would have short-term minor adverse impacts to park visitors. Those overlooks requiring only spot repairs would not be totally closed to the public. However, noise and the presence of work crews at these overlooks would result in short-term minor adverse impacts. Long-term minor beneficial impacts to visitor use and experience would occur after the rehabilitation efforts are completed and the overlooks are improved, by providing park visitors with aesthetically pleasing and a historically accurate representation of the original CCC-built overlooks.

Stony Man Overlook is one of the overlooks that would require total reconstruction. The Appalachian Trail runs adjacent to this overlook. During the rehabilitation of this overlook, hikers on this portion of the trail would experience noise from construction activities and crews, and there would be the need to reroute hikers to avoid construction activities. As a result of the rehabilitation activities occurring at Stony Man Overlook, there would be short-term minor adverse impacts to hikers using this portion of the Appalachian Trail. These impacts would be short-term and minor since they would only affect trail users; the trail would not be closed, and it would not take a hiker long to walk past the disturbance.

Removing and revegetating six non-historic/informal pull-offs would require motorists to slow down or stop entirely in the areas where these activities were taking place. Flaggers and warning signs would be placed at either end of the construction area to ensure both visitor and worker safety. Delay times for motorists are expected to be up to 15 minutes. The presence of work crews and construction equipment along Skyline Drive, as well as short delay times would have short-term minor adverse impacts to visitor use and experience.

Repaving and reconfiguring the parking areas at Dark Hollow Overlook and Limberlost Trailhead would have short-term minor adverse impacts to visitor use and experience as these areas would be closed during the repaving process, and park visitors would not have access to the trails during that period. Once completed however, these parking areas would be improved and better organized, resulting in long-term minor beneficial impacts to visitor use and experience.

Cumulative Impacts. NPS projects within Shenandoah National Park such as the new comfort station at Byrd Visitor Center, the interior renovations and exhibits at Byrd Visitor Center, and NPS and FHWA roadway improvement projects in the vicinity of Skyline Drive would have long-term beneficial impacts to visitor use and experience by improving the park's facilities and overall interpretative capabilities. However, roadway improvement projects could potentially have short-term minor adverse impacts to Skyline Drive with more trucks and/or other construction equipment going to and from improvement sites. In addition, there could potentially be impacts to the ingress and egress of these roads onto Skyline Drive from construction activities, which could cause minor adverse impacts to those using Skyline Drive. These impacts in combination with the minor adverse short-term and long-term beneficial impacts of alternative B would result in some short-term minor adverse cumulative impacts and long-term beneficial cumulative impacts to visitor use and experience.

Conclusion. Implementation of alternative B would result in short-term minor adverse impacts to visitor use and experience from delays to traffic, overlook and trailhead parking area closures, and disruptions caused by construction activities along Skyline Drive and at the overlooks. Long-term minor beneficial impacts to visitor use and experience would occur as a result of improved overlooks and parking areas. Short-term minor adverse cumulative impacts would result from construction with long-term minor beneficial cumulative impacts resulting from overall road improvements within the park.

Impacts of Alternative C – Rehabilitation Based on Engineering Study Recommendations

Analysis. Alternative C would call for the rehabilitation of 49 overlooks located along Skyline Drive based on engineering recommendations. Activities associated with the rehabilitation of the park's historic overlooks that could potentially impact visitor use and experience includes the temporary closure of those overlooks requiring total or partial reconstruction and disturbance and noise associated with all rehabilitation activities. To assure visitor safety, overlooks that require total or partial reconstruction would have to be closed to the public while construction activities are taking place. Those overlooks requiring total reconstruction could be closed for up to two years, while those overlooks requiring partial reconstruction could be closed for up to one year, and maybe longer depending upon the extent of reconstruction. Since only one or two of the 69 overlooks would be closed at any one time, closing these overlooks would have short-term minor adverse impacts to park visitors. Those overlooks requiring only spot repairs would not be totally closed to the public. However, noise and the presence of work crews at these overlooks would result in short-term minor adverse impacts.

Stony Man Overlook is one of the overlooks that would require total reconstruction. The Appalachian Trail runs adjacent to this overlook. During the rehabilitation of this overlook, hikers on this portion of the trail would experience noise from construction activities and crews, and there would be the need to reroute hikers to avoid construction activities. As a result of the rehabilitation activities occurring at Stony Man Overlook, there would be short-term minor adverse impacts to hikers using this portion of the Appalachian Trail. These impacts would be short-term and minor since they would only affect trail users, the trail would not be closed, and it would not take a hiker long to walk past the disturbance.

Removing and revegetating six non-historic/informal pull-offs would require motorists to slow down or stop entirely in the areas where these activities were taking place. Flaggers and warning signs would be placed at either end of the construction area to ensure both visitor and worker safety. Delay times for motorists are expected to be up to 15 minutes. The presence of work crews and construction equipment along Skyline Drive, as well as short delay times would have short-term minor adverse impacts to visitor use and experience.

Repaving and reconfiguring the parking areas at Dark Hollow Overlook and Limberlost Trailhead would have short-term minor adverse impacts to visitor use and experience as these areas would be closed during the repaving process, and park visitors would not have access to the trails during that period. Once completed however, these parking areas would be improved and better organized, resulting in long-term minor beneficial impacts to visitor use and experience.

Cumulative Impacts. NPS projects within Shenandoah National Park such as the new comfort station at Byrd Visitor Center, the interior renovations and exhibits at Byrd Visitor Center, and NPS and FHWA roadway improvement projects in the vicinity of Skyline Drive would have long-term beneficial impacts to visitor use and experience by improving the park's facilities and overall interpretative capabilities. However, roadway improvement projects could potentially have short-term minor adverse impacts to Skyline Drive with more trucks and/or other construction equipment going to and from improvement sites. In addition, there could potentially be impacts to the ingress and egress of these roads onto Skyline Drive from construction activities, which could cause minor adverse impacts to those using Skyline Drive. These impacts in combination with the short-term minor adverse and long-term beneficial impacts of alternative C would result in some short-term minor adverse cumulative impacts and long-term beneficial cumulative impacts to visitor use and experience.

Conclusion. Implementation of alternative C would result in short-term minor adverse impacts to visitor use and experience from delays to traffic, overlook closures, and disruptions caused by construction activities at the overlooks. By implementing the engineering recommendations, there would be short- to long-term minor adverse impacts on park visitors experience from the presence of work crews and traffic delays to overall changes in the historic landscape. Long-term minor beneficial impacts to visitor use and experience would occur as a result of improved parking areas. Short-term minor adverse cumulative activities would occur related to construction with long-term beneficial cumulative impacts resulting from overall road improvements within the park.

HEALTH AND SAFETY

Methodology and Assumptions

The analysis of health and safety considered the safety deficiencies caused by the deterioration of historic stone guardwalls, retaining walls, and parking areas at the overlooks.

Study Area

The study area for health and safety issues includes the area within the footprint of each overlook and the visitor sites accessed from the overlooks.

Impact Thresholds

The impact intensities for health and safety follow. Where impacts to health and safety became moderate, it is assumed that current visitor satisfaction and safety levels would begin to decline and some of the national recreation area's long-term visitor goals would not be achieved.

Negligible – The impact to health and safety would not be measurable or perceptible. Emergency response capabilities would not be affected.

Minor – The impact to health and safety would be measurable or perceptible, but it would be limited to a relatively small number of visitors at localized areas. Impacts to health and safety might be realized through a small increase in the potential for visitor conflicts in current accident areas. Emergency response capabilities would be affected; however, impacts would be small and easily mitigated.

Moderate – The impact to health and safety would be sufficient to cause a change in accident rates at existing low accident locations or to create the potential for additional visitor conflicts in areas that currently do not exhibit noticeable accident trends. Emergency response capabilities

would be impacted and mitigation to offset adverse effects would be extensive, but likely successful.

Major – The impact to health and safety would be substantial. Accident rates in areas usually limited to low accident potential are expected to substantially increase in the short and long term. Emergency response capabilities would be changed substantially and mitigation measures would be extensive.

Duration – Short-term impacts occur during all or part of alternative implementation; long-term impacts extend beyond implementation of the alternative.

Impacts of Alternative A – No Action Alternative

Analysis. Under this alternative, maintenance to the overlooks would continue at a level that would keep these facilities safe for public use. However, measures to improve minor safety deficiencies such as replacing and adding guardwalls, removing the rolled asphalt sidewalks, and the resurfacing parking areas would not be required. These safety deficiencies could lead to trips and falls, resulting in long-term minor adverse impact to human health and safety.

Cumulative Impacts. Roadway improvement projects that would be implemented by the NPS and FHWA could potentially cause slight delays in the response time of emergency service vehicles due to construction-related traffic and activities resulting in a short-term minor adverse impact to health and safety. In the long term, these road improvements would be beneficial for emergency access into these areas. These impacts in combination with short-term minor adverse impacts of the no action alternative would result in short-term minor adverse and long-term beneficial cumulative impacts to health and safety.

Conclusion. Implementation of the no action alternative would result in long-term minor adverse impacts to health and safety as a result of continued safety deficiencies at the overlooks. Cumulative impacts to emergency services would be short-term, minor and adverse, but beneficial in the long term due to improved park roads.

Impacts of Alternative B – Rehabilitation with Preservation and Rehabilitation of Historic Features

Analysis. Activities with the potential to impact human health and safety in alternative B include those measures required to improve safety deficiencies at the overlooks such as replacing and adding guardwalls, removing the rolled asphalt sidewalks, and resurfacing parking areas. In addition, activities associated with removing six non-historic/informal pull-offs along Skyline Drive could potentially cause traffic hazards along Skyline Drive.

To protect the public and employees from potential risks associated with rehabilitation activities proposed for the overlooks, repaving and reconfiguring the parking areas at Dark Hollow Overlook and Limberlost Trailhead, and measures to remove six non-historic/informal pull-offs, signs would be installed around the construction zone along Skyline Drive to notify motorists of the need to reduce speed. When construction activities are occurring, or when equipment is being used near the road, the lane adjacent to the construction zone would be closed to traffic. Traffic would be diverted around the construction zone via the open lane with the use of construction personnel with flags. Closing the adjacent lane would provide a safety buffer between the construction zone and motorists. In addition, the overlooks where rehabilitation efforts (such as partial and total reconstruction) would occur would be temporarily closed to the public. With all of these measures in place, public safety risks during construction activities would be very low, resulting in negligible to minor adverse impacts to health and safety.

Following construction, the repaired stone guardwalls, the new wooden guiderails, and the newly resurfaced parking areas would correct the safety deficiencies that currently exist at the overlooks. In addition, the removal of the rolled asphalt curbs would make the overlooks more safe and accessible for persons with disabilities. As a result of these improvements, long-term minor beneficial impacts to the health and safety of park visitors and staff would occur.

Cumulative Impacts. Roadway improvement projects that would be implemented by the NPS and FHWA could potentially cause slight delays in the response time of emergency service vehicles due to construction-related traffic and activities resulting in a short-term minor adverse impact to health and safety. However, these projects would also provide long-term improvements to park-wide health and safety by upgrading roads and other facilities resulting in long-term beneficial impacts. These impacts, in combination with short-term minor adverse impacts and long-term beneficial impacts of alternative B would result in short-term minor adverse and long-term minor beneficial cumulative impacts to health and safety.

Conclusion. Implementation of alternative B would result in short- to long-term negligible to minor adverse impacts to health and safety during construction and long-term minor beneficial impacts following construction as a result of the correction of safety deficiencies at the overlooks and making the overlooks more accessible for people with limited mobility. Cumulative impacts would be short-term minor adverse and long-term minor beneficial following construction.

Impacts of Alternative C – Rehabilitation Based on Engineering Study Recommendations

Analysis. Activities with the potential to impact human health and safety in alternative C include those measures required to improve safety deficiencies at the overlooks such as replacing and adding guardwalls, removing the rolled asphalt sidewalks, and the resurfacing parking areas. In addition, activities associated with removing six non-historic/informal pull-offs along Skyline Drive could potentially cause traffic hazards along Skyline Drive.

To protect the public and employees from potential risks associated with rehabilitation activities proposed for the overlooks, repaving and reconfiguring the parking areas at Dark Hollow Overlook and Limberlost Trailhead, and measures to remove six non-historic/informal pull-offs, signs would be installed around the construction zone along Skyline Drive to notify motorists of the need to reduce speed. When construction activities are occurring, or when equipment is being used near the road, the lane adjacent to the construction zone would be closed to traffic. Traffic would be diverted around the construction zone via the open lane with the use of construction personnel with flags. Closing the adjacent lane would provide a safety buffer between the construction zone and motorists. In addition, the overlooks where rehabilitation efforts (such as partial and total reconstruction) would occur would be temporarily closed to the public. With all of these measures in place, public safety risks during construction activities would be very low, resulting in negligible to minor adverse impacts to health and safety.

Following construction, the repaired stone guardwalls, the new guiderails, and the newly resurfaced parking areas would correct the safety deficiencies that currently exist at the overlooks, resulting in long-term minor beneficial impacts to health and safety. In addition, there would be long-term minor beneficial impacts from reconstructing and widening rolled asphalt sidewalks, which would create safer opportunities for visitors with disabilities who utilize the park.

Cumulative Impacts. Roadway improvement projects that would be implemented by the NPS and FHWA could potentially cause slight delays in the response time of emergency service vehicles, which could result in a short-term minor adverse impact to health and safety. However, these projects would also provide long-term improvements to park-wide health and safety by upgrading roads and other facilities resulting in long-term beneficial impacts. These impacts in combination with short-term minor adverse impacts and long-term beneficial impacts of alternative C would result in short-term minor adverse and long-term minor beneficial cumulative impacts to health and safety.

Conclusion. Implementation of alternative C would result in short-term negligible to minor adverse impacts to health and safety during construction and long-term minor beneficial impacts following construction as a result of correcting safety deficiencies and reconstructing and widening rolled asphalt sidewalks at the overlooks, making it more accessible for people with limited mobility. Cumulative impacts would be short-term minor adverse and long-term minor beneficial following construction.

PARK OPERATIONS

Methodology and Assumptions

Park operations, for the purpose of this analysis, refers to the quality and effectiveness of the infrastructure, and the ability to maintain the infrastructure used in the operation of the park in order to adequately protect and preserve vital resources and provide for an effective visitor experience. This includes an analysis of the condition and usefulness of the facilities and developed features used to support park operations. Facilities included in this project include the overlooks along Skyline Drive and associated recreational and administrative facilities. Park staff who are knowledgeable of these issues were members of the planning team that evaluated the impacts of each alternative. Impact analysis is based on the current description of park operations presented in the “Affected Environment” chapter of this document.

Study Area

The study area for park operations includes the entire length of Skyline Drive, its overlooks, and any administrative and recreational facilities associated with the overlooks.

Impact Thresholds

Impact thresholds that measure the relative change in agency operations as a result of each alternative are as follows.

Negligible – Park or agency operations would not be impacted or the impact would not have a noticeable or appreciable effect on park or agency operations.

Minor – Impacts would be noticeable, but would be of a magnitude that would not result in an appreciable or measurable change to park or agency operations.

Moderate – Impacts would be readily apparent and would result in a substantial change in park or agency operations that would be noticeable to staff and the public. Mitigation could be required and may be effective.

Major – Impacts would be readily apparent and would result in a substantial change in park operations that would be noticeable to staff and the public, and would require the park to readdress its ability to sustain current park operations.

Duration – Short-term impacts occur during all or part of alternative implementation; long-term impacts extend beyond implementation of the alternative.

Impacts of Alternative A – No Action Alternative

Analysis. Under the no action alternative, there would be no routinely scheduled maintenance of the overlooks (Herzog 2005). Maintenance at the overlooks would be performed as necessary and as funding allowed. As the overlooks continue to degrade over time, the frequency that they would require maintenance would increase, taking away manpower and funds away from other park operations. As a result, there would be long-term minor adverse impacts to park operations and management.

Cumulative Impacts. Implementation of NPS and FHWP roadway improvement projects in the park would have short-term negligible adverse impacts to park operations and maintenance. Heavy equipment needed for some of these improvements would require transport along Skyline Drive, potentially damaging the road and increasing park operations and maintenance requirements. However, with the repair of these roads, there would be less future maintenance needs resulting in long-term minor beneficial impact to park operations and management. These impacts in combination with the long-term minor adverse impacts of the no action alternative would result in long-term minor adverse cumulative impacts since park operation and maintenance requirements would increase overall.

Conclusion. Implementation of the no action alternative would result in long-term minor adverse impacts to park operations due to the continued deterioration of the overlooks, which would lead to increased

future maintenance. Cumulative impacts to park operations and maintenance would be long-term minor adverse.

Impacts of Alternative B – Rehabilitation with Preservation and Rehabilitation of Historic Features

Analysis. Alternative B would involve the rehabilitation of 49 overlooks located along Skyline Drive based on historic design. While routine maintenance would continue as needed, overall maintenance requirements would decrease with the rehabilitation of the overlooks. Rehabilitation efforts proposed under this alternative would reduce the overall maintenance frequency and the probability of any emergency repairs that may become required at the overlooks. While there would be beneficial long-term impacts to park operations and management as a result of rehabilitating the overlooks, because maintenance at the overlooks is currently only performed as necessary and as funding allows, long-term beneficial impacts to park operations and management would be considered minor because the reuse of historic materials would require more maintenance than using new construction materials. These impacts would be noticeable but would not have an appreciable or measurable effect on current park operations.

Cumulative Impacts. Implementation of NPS and FHWA roadway improvement projects in the park would have short-term negligible adverse impacts to park operations and maintenance. Heavy equipment needed for some of these improvements would require transport along Skyline Drive, potentially damaging the road and increasing park operations and maintenance requirements. However, with the repair of these roads, there would be less future maintenance needs resulting in long-term minor beneficial impacts to park operations and maintenance. These impacts in combination with long-term negligible beneficial impacts of alternative B would result in long-term minor beneficial cumulative impacts since road rehabilitation efforts throughout the park could result in a park-wide reduction in maintenance requirements.

Conclusion. Implementation of alternative B would reduce the amount of long-term and emergency maintenance needed for the overlooks located along Skyline Drive, resulting in long-term minor beneficial impacts. Long-term minor beneficial cumulative impacts to park operations would occur.

Impacts of Alternative C – Rehabilitation Based on Engineering Study Recommendations

Analysis. Alternative C would involve the rehabilitation of 49 overlooks located along Skyline Drive based on engineering designs. While routine maintenance would continue as needed, overall maintenance requirements would decrease with the rehabilitation of the overlooks. Rehabilitation efforts proposed under this alternative would reduce the overall maintenance frequency and the probability of any emergency repairs that may become required at the overlooks. While there would be beneficial long-term impacts to park operations and management as a result of rehabilitating the overlooks, because maintenance at the overlooks is currently only performed as necessary and as funding allows, long-term beneficial impacts to park operations and management would be considered negligible because these impacts would not have a noticeable or appreciable effect on the current park operations.

Cumulative Impacts. Implementation of NPS and FHWA roadway improvement projects in the park would have short-term negligible adverse impacts to park operations and maintenance. Heavy equipment needed for some of these improvements would require transport along Skyline Drive, potentially damaging the road and increasing park operations and maintenance requirements. However, with the repair of these roads, there would be less future maintenance needs resulting in long-term minor beneficial impacts to park operations and maintenance. These impacts, in combination with long-term negligible beneficial impacts of alternative C, would result in long-term minor beneficial cumulative impacts.

Conclusion. Implementation of alternative C would reduce the amount of long-term and emergency maintenance needed for the overlooks located along Skyline Drive, resulting in long-term negligible beneficial impacts. Long-term minor beneficial cumulative impacts to park operations would occur.

COORDINATION AND CONSULTATION

Coordination with local and federal agencies was conducted during the NEPA process to identify issues and/or concerns related to natural and cultural resources within Shenandoah National Park.

In accordance with Section 106 of the National Historic Preservation Act of 1966, the park has consulted with the State Historic Preservation Officer (SHPO) at the Virginia Department of Historic Resources. On May 14, 2007, the park provided the SHPO with a determination of no adverse effect on the first phase of the project (i.e., rehabilitation of the first five overlooks and two parking areas). The SHPO concurred with this determination on June 4, 2007 (appendix C). To address subsequent phases of the project, the park and the SHPO agreed to execute a Programmatic Agreement (PA) in accordance with Section 106 regulations. The PA outlines specific actions that would be taken during the rehabilitation of the remaining overlooks to avoid or minimize potential adverse effects on Skyline Drive and the Skyline Drive Historic District. A draft of this PA is provided in appendix C for public review and comment along with this EA.

In accordance with Section 7 of the Endangered Species Act of 1973, a letter was sent on behalf of Shenandoah National Park to solicit comments from the United States Fish and Wildlife Service (USFWS) regarding the proposed rehabilitation of Skyline Drive and 49 overlooks, and the park's determination that this proposed action would have no effect on the federally endangered Shenandoah salamander and its known habitat. A response from the USFWS was received on April 7, 2005 concurring that the proposed action would not adversely affect federally listed species or federally designated critical habitat (see appendix A).

This EA will be distributed for public and agency review with a comment period of at least 30 days. The NPS will consider the comments in making a decision.

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REFERENCES CITED

American Association of State Highway and Transportation Officials (AASHTO)

- 1994 *1994 Green Book: A Policy on Geometric Design of Highways and Streets*. American Association of State Highway and Transportation Officials, Washington DC.

Birnbaum, Charles A.

- 1996 *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes*. National Park Service, Washington, D.C.

Cowardin et al.

- 1979 *Classification of Wetlands and Deepwater Habitats of the United States*. Prepared for the U.S. Department of the Interior, Fish and Wildlife Service, Office of Biological Services, Washington, DC 20240.

Engle, Reed

- 1999 *Everything Was Wonderful, A Pictorial History of the Civilian Conservation Corps in Shenandoah National Park*. Shenandoah National Park Association, Inc., Luray, Virginia.
- 2003 *In the Light of the Mountain Moon, An Illustrated History of Skyland, 1853-2003*. Shenandoah National Park Association, Inc., Luray, Virginia.

Federal Highway Administration (FHWA)

- 2001 *Engineering Study for Roads and Bridges, Shenandoah National Park, Virginia*. Eastern Federal Lands Highway Division. Prepared for National Park Service, Northeast Region.
- 2004 *Design Scoping Report: Skyline Drive Central District for Shenandoah National Park*. Eastern Federal Lands Highway Division. Prepared for National Park Service, Northeast Region.

Federal Interagency Committee on Noise (FICON)

- 1992 *Federal Agency Review of Selected Airport Noise Analysis Issues*.

Littlejohn, Margaret

- 2002 *Shenandoah National Park Visitor Study, Summer 2001*. Visitor Services Project Report 127.

Ludwig, J.C., et. al.

- 1993 *A Natural Heritage Inventory of Mid-Atlantic Region National Parks in Virginia: Shenandoah National Park*. Division of Natural Heritage, Virginia Department of Conservation and Recreation, Richmond, Virginia.

Maddex et al.

- 1999 Maddex, Lee R., Kevin A. McClung, and Linda F. McClelland, Skyline Drive Historic District National Register/National Historic Landmark nomination, 1997.

McNab, W.H.

- 1994 *Ecological Subregions of the United States*. USDA Forest Service, Washington, DC. WO-WSA-5. <http://www.fs.fed.us/land/pubs/ecoregions/>

McClelland, Linda Flint

- 1998 "Skyline Drive Historic District, A Meeting Place of Culture and Nature." *Cultural Resource Management* (20:13-15), Reed L. Engle, editor.

Nash, Carole, and Lillian Ledford

- 2004 *An Archaeological Assessment of Browntown Valley and Gimlet Ridge Overlooks, Skyline Drive, Shenandoah National Park*. Submitted to Shenandoah National Park by the Department of Sociology and Anthropology, James Madison University, Harrisonburg, Virginia.

National Park Service (NPS)

- 1983 *General Management Plan/ Development Concept Plan*. Shenandoah National Park, Virginia. Denver Service Center, Denver, Colorado.
- 1984 *Park Road Standards*. Memo to the Director. Accessible at <http://www.nps.gov/policy/DOrders/ParkRoadStandards.pdf>.
- 1997a *Shenandoah National Park Skyline Drive Roadside Barrier Replacement Guide*. Prepared by Department of Transportation, Federal Highway Administration, Eastern Federal Lands Highway Division, Sterling, VA.
- 1998a *Resource Management Plan*. Shenandoah National Park.
- 1998b Director's Order 28, *Cultural Resource Management Guideline – Appendix P*
- 1999 Director's Order 50B, *Occupational Safety and Health Program*.
- 2000a *Strategic Plan for Shenandoah National Park, Fiscal Years 2001-2005*.
- 2000b Director's Order 47, *Soundscape Preservation and Noise Management*. Available at <http://www.nps.gov/policy/DOrders/DOrder47.html>
- 2001 Director's Order 12, *Conservation Planning, Environmental Impact Analysis, and Decision-Making*. Available at <http://www.nps.gov/refdesk/DOrders/DOrder12.html>
- 2002a Director's Order 77-2, *Floodplain Management*. Available at <http://www.nps.gov/policy/DOrders/DO77-2--Floodplains.pdf>
- 2002b Shenandoah Official Map and Guide. U.S. Department of Interior, National Park Service.
- 2004 *Rehabilitation of Panorama as a Visitor/Education Center Environmental Assessment, Shenandoah National Park, Page and Rappahannock Counties, Virginia*.
- 2005 Visitation Database Reports. Available at <http://www2.nature.nps.gov/npstats/npstats.cfm>
- 2006 *2006 Management Policies*. U.S. Department of the Interior, National Park Service. Washington, DC. August 31, 2006.

U.S. Department of Agriculture (USDA)

- nd Soil Series Classification Database. Available at <http://soils.usda.gov/technical/classification/osc/index.html> [Accessed January 27, 2005].
- 1981 "Land Resource Regions and Major Land Resource Areas of the United States." *Soil Conservation Service Handbook* 296. Available at <http://soilphysics.okstate.edu/S257/south/mlra/130.htm>.

U.S. Department of Transportation, Federal Highway Administration (USDOT)

- nd "A Message from the Administrator," Jane F. Garvey, Acting Federal Highway Administrator, included on page iii of the publication, *Flexibility in Highway Design*. U.S. Department of Transportation, Federal Highway Administration.

U.S. Fish and Wildlife Service (USFWS)

- 1994 *Shenandoah Salamander (Plethodon shenandoah) Recovery Plan*. Region Five. Hadley, Massachusetts.

Virginia Department of Conservation and Recreation (VDCR)

- 2006 *Virginia Erosion and Sediment Control Law, Regulations, and Certification Regulations*. Department of Conservation and Recreation: Division of Soil and Water Conservation. July 2006

Virginia Department of Transportation (VDOT)

- 2005a *Six-Year Transportation Program*. Available at <http://www.viriniadot.org/projects/pr-studieslongrange.asp>.
- 2005b *Long Range Transportation Planning*. Available at <http://www.viriniadot.org/projects/pr-studieslongrange.asp>

Waynesboro, VA

- 2004 *Waynesboro City Council Vision for 2018*. Waynesboro, VA, 2004. Available at <http://www.waynesboro.va.us/councilvision.pdf>

Personal Communications

- Engle, Reed. Shenandoah National Park. Personal communication via email, February 20, 2007.
- Herzog, Steve. Shenandoah National Park. Personal communication via email, February 2, 2005.

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Appendix A
U.S. Fish and Wildlife Service Consultation

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IN REPLY REFER TO:

United States Department of the Interior

NATIONAL PARK SERVICE
DENVER SERVICE CENTER
12795 W. ALAMEDA PARKWAY
P.O. BOX 25287
DENVER, COLORADO 80225-0287



DEC 06 2005

Ms. Karen Mayne, Field Supervisor
U.S. Fish & Wildlife Service
6669 Short Lane
Gloucester, VA 23061

Re: Request for Informal Consultation Shenandoah salamander (*Plethodon shenandoah*)

Dear Ms. Mayne:

The National Park Service is proposing to rehabilitate the entire 105-mile length of Skyline Drive and 49 of its 69 historic overlooks at Shenandoah National Park (hereafter referred to as the Park) in Page and Rappahannock counties. The federally endangered Shenandoah salamander (*Plethodon shenandoah*) is known to occur and have habitat within the vicinity of the project area. The following details the proposed action, the purpose and need for the action, proposed mitigation measures, and National Park Service findings.

From the descriptions of the proposed actions and their associated mitigation, coupled with species information provided in the U.S. Fish and Wildlife Service 1994 *Recovery Plan of the Shenandoah Salamander* and from the Virginia Department of Game and Inland Fisheries, the National Park Service has determined that with avoidance there would be no effect to the Shenandoah salamander or its habitat; the Shenandoah salamander or its continued existence would not be jeopardized. We respectfully ask for your concurrence in this matter.

NATIONAL PARK SERVICE PROJECT PURPOSE AND NEED

The purpose of the road rehabilitation work is to bring the road in to good driving condition for all of its intended uses. This would involve repaving the existing road surface and, where needed, spot reconstruction of the road aggregate base course, curve widening, shoulder stabilization, and minor drainage work. The purpose of the rehabilitation of the overlooks is to remediate unsafe conditions and to stabilize fill slopes, some of which are failing and causing settlement problems for the overlooks and associated structures. An important aspect of this rehabilitation project will be preserving the historic character of the overlooks by retaining and, where necessary, repairing significant character-defining features.

This action is needed return the road and overlooks to good condition, which can be accomplished without major reconstruction if the work is accomplished in a timely manner.

SHENANDOAH SALAMANDER (*PLETHODON SHENANDOAH*)

Listed as endangered by the Commonwealth of Virginia on October 1, 1987, the Shenandoah salamander (*Plethodon shenandoah*), was designated federally endangered on August 18, 1989. A small terrestrial salamander, it exists entirely within Shenandoah National Park on only three mountains, including Hawksbill, Stony Man, and The Pinnacle, at elevations above 3,000 feet (USFWS 1994). The habitat of

the Shenandoah salamander is located within the general vicinity of Skyline Drive and several of the drive's overlooks. It is found on talus slopes with deep pockets of soil in mixed-conifer forest on the north and northwestern faces of these mountain ranges.

NATIONAL PARK SERVICE PROPOSED ACTION

Rehabilitation of Skyline Drive would include resurfacing of the entire length of the drive, while staying within its original footprint, whenever possible, construction activities would include:

- spot reconstruction of the road aggregate base course, where needed;
- milling and repaving the existing road surface;
- shoulder stabilization, where needed;
- minor widening of curves, where needed for safety purposes; and
- minor drainage work.

Repair of the overlooks would include, where needed:

- repair or reconstruction of the stone retaining walls;
- repaving the parking areas;
- repair or reconstruction of the stone guardwalls;
- removal of the existing rolled asphalt curbing and sidewalk and replacement with more historically accurate materials; and
- installation of historically accurate wooden guardrails.

In both the rehabilitation of Skyline Drive and the overlooks, construction activities, for the most part, would be confined to the original footprint of the road and overlooks. However, in certain areas along the road, it would be necessary to widen some of the curves for safety reasons. In addition, at those overlooks where reconstruction of retaining walls is necessary, construction activities would have to go beyond the original footprint at the base of the existing retaining walls.

MITIGATION

In addition to minimizing the area of new disturbance, additional mitigation measures would be implemented during construction to minimize adverse impacts to the park's natural resources. Mitigation measures that relate to the protection of the Shenandoah salamander and/or its habitat include:

- Require a survey of the project area be conducted by an NPS biologist prior to the onset of construction for the presence of listed/rare species.
- Provide construction workers with a photograph of the Shenandoah salamander, instruct workers to stop work if a Shenandoah salamander is encountered at the site, and notify

the NPS immediately; NPS would then immediately notify the U.S. Fish and Wildlife Service for consultation.

- Delineate and protect from construction activities those areas adjacent to Skyline Drive where known habitat exists for any federally listed threatened or endangered or state sensitive and state rare species are known to occur.
- Minimize the cutting of trees whenever possible.
- Minimize trimming and removal of vegetation to accommodate construction equipment ingress and egress.
- Avoid collision of equipment with trees and other vegetation and place protective armoring around tree trunks in close proximity to construction activities to minimize potential adverse effects to bark, etc. resulting from collision.
- Prepare and implement an erosion and sediment control plan, consistent with Virginia Erosion and Sediment Control Law, Regulations, and Certification Regulations (VESCL&R), VESCL&R Minimum Standards, General Virginia Pollutant Discharge Elimination System (VPDES) Permit Regulation for Discharges of Storm Water from Construction Activities, and the guidance provided in the Virginia Erosion and Sediment Control Handbook.
- Minimize erosion from construction activities through the use of silt fences, erosion control blankets, streambank stabilization, and retaining walls.
- During construction, control drainage so that water is not directed down steep slopes, decreasing its velocity and erosion potential.
- Armor ditches on a site-by-site basis to prevent scouring and erosion.
- Provide culvert outlet protection (riprap aprons or basins) to reduce water velocity and prevent scour erosion.
- If work extends beyond paved roadways and curbs, install construction fencing to clearly delineate the project disturbance limits prior to commencement of work by the contractor.
- Clearly state all mitigation measures in the construction specifications and instruct workers to avoid conducting activities beyond the construction zone, as defined by the roadway or construction zone fencing.

HISTORY, BIOLOGY, AND EXISTING THREATS OF SHENANDOAH SALAMANDER

All members of the genus *Plethodon* are terrestrial and sometimes referred to as woodland salamanders. These salamanders are generally found in forested conditions, where the presence of an overstory promotes surface moisture. They are primarily nocturnal, spending the day under protective cover or in rock crevices; their movements are restricted during droughts (USFWS 1994).

The diet of woodland salamanders generally consists of insects and other soil invertebrates. Breeding typically takes place in late spring or summer, and fertilization is internal. In contrast with most other salamanders, woodland salamanders develop completely within the egg. The lack of an aquatic larval

stage frees these salamanders from a mandatory proximity to open or flowing water. Small egg clusters (3-17 eggs) are laid in damp logs, moss, or other available crevices, and the female generally guards the eggs. Incubation lasts one to three months, during which time the female does not forage for food. Females usually do not breed before the age of four years, and generally breed only every other year thereafter. Adult survival was found to be high, with a small percentage surviving 25 years or longer (USFWS 1994).

Past effects of naturally-occurring fires, farming, and timbering operations (which occurred prior to the establishment of Shenandoah National Park in 1936) on the current limited distribution of the Shenandoah salamander is not known. Natural threats to this salamander's continued existence include: (1) competition with the aggressive and successful red-backed salamander (*P. cinereus*), which confines the Shenandoah salamander to a few relatively dry talus areas that are not utilized by this competitor; and (2) eventual succession of this talus, through weathering and soil formation, to moister habitat, more suitable for occupation by the red-backed salamander (Jaeger 1970). The red-backed salamander is widely distributed and completely surrounds each of the three isolated populations of the Shenandoah salamander (USFWS 1994).

Along with these naturally occurring threats to the salamander's continued existence, two major, relatively recent human related factors appear to also have the potential of further impact the species. These include: (1) defoliation of trees within its habitat, associated with outbreaks of gypsy moths (*Lymantria dispar*), hemlock woolly adelgids (*Adelges tsugae*), or other introduced forest pest species, and (2) further debilitation of overstory vegetation, changes in soil chemistry, and direct impacts to the salamanders associated with acid rain and other sources of air pollution (USFWS 1994).

The spread of introduced forest pest species within the range of the Shenandoah salamander is too recent to have documented effects on the salamanders. However, defoliation and tree mortality associated with gypsy moths is well-documented, and hemlock woolly adelgids are becoming a serious threat to hemlock survival within Shenandoah National Park. Habitat changes associated with these insect pests could result in adverse effects to Shenandoah salamanders. For example, in certain sections of Shenandoah salamander habitat where hemlock mortality is high (i.e., Stony Man), the duff layer now consists almost entirely of hemlock needles. This will certainly lower substrate pH, which, in turn, may alter soil microbe and invertebrate composition, with unknown effects to salamander physiology and foraging success. Defoliation caused by gypsy moths results in increased ground-level isolation, at least temporarily, with unknown effects to salamanders. One possible result of defoliation is the increased exposure of the talus substrate to sunlight, which warms and dries the substrate beyond the Shenandoah salamander's tolerance or reproductive limits (USFWS 1994).

Other potential effects include the possibility that an increase in groundcover following overstory removal could alter the Shenandoah salamander's prey-capturing ability, or "tip the ecological balance" in favor of red-backs. Acid deposition may also act synergistically with forest insect pests, further increasing tree mortality (USFWS 1994).

Acid deposition and other sources of air pollution are well-documented at Shenandoah National Park. As with forest pests, effects of these factors on Shenandoah salamanders have not been documented; however, numerous studies have indicated that amphibians may be highly vulnerable to the effects of acid deposition, particularly in mountain areas. Although the Shenandoah salamander does not have an aquatic larval stage, acidification of its habitat substrate could affect the species' food supply, or could impair reproduction by directly affecting courtship, egg hatchability, or neonate viability. Because salamanders forage preferentially during rainy or foggy weather, they would be particularly susceptible to any directly irritating effects acid deposition may have on their integument. Salamanders could also be affected by

other air pollutants such as formaldehyde. Amphibians have proven to be more highly susceptible to formalin, the dissolved form of this pollutant, than are fish or invertebrates (USFWS 1994).

NO IMPACTS TO SHENANDOAH SALAMANDER FROM THE PROPOSED ACTION

Construction activities associated with the rehabilitation of Skyline Drive and its overlooks and the subsequent operation of these facilities would not affect the Shenandoah salamander or its required habitat. During all construction activities, the NPS would implement mitigation measures for the protection of natural and biological resources, as well as mitigation that specifically address the Shenandoah salamander and its required habitat.

In addition, according to information taken from the U.S. Fish and Wildlife's 1994 *Shenandoah Salamander (Plethodon shenandoah) Recovery Plan*, the majority of areas where the Shenandoah salamander is known to exist are located far enough away (greater than 1000 feet) from Skyline Drive and the overlooks that there would be no direct impacts on the species from construction activities (see Figures 1-3). Any indirect impacts resulting from construction activities (e.g. increased erosion, degradation of water quality) that could affect the salamander or its habitat would be avoided through implementation of the mitigation measures described above.

There are several areas adjacent to Skyline Drive, south of the Stony Man Overlook, where potential habitat exists and two small areas where the salamander is known to exist (see Figure 2). Rehabilitation of Skyline Drive in these areas is not expected to affect the salamander, its known habitat, or potential habitat for the following reasons:

- The majority of construction activities associated with the road and its overlooks would remain within the roadway's original footprint. In those areas where construction may be required outside the existing road footprint, NPS would survey for the presence of federally and state listed species prior to the start of any construction activities. Should any species be found, proper mitigation measures would be implemented or the area avoided.
- All mitigation measures described above would be implemented.
- Staging areas would be restricted to existing overlooks and existing maintenance staging areas.

Rehabilitation of the overlooks is also not expected to affect the Shenandoah salamander, as no known habitat occurs near any of the overlooks. There would be no loss of forest cover because the areas below the overlooks have been kept clear of trees to a distance of 50 to 200 yards to maintain historic vistas; creating sun drenched grassy areas with a few scattered trees, resulting in unsuitable salamander habitat.

We do not anticipate that this project would contribute to cumulative impacts because this action is not expected to impact the Shenandoah salamander or its habitat.

CONCLUSION

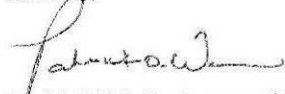
Based on the location of the proposed project area in relation to the Shenandoah salamander's currently known habitat, and the mitigation and avoidance measures that would be implemented during construction, the National Park Service has determined that the proposed rehabilitation of Skyline Drive and its associated overlooks at Shenandoah National Park would have no effect on the Shenandoah

salamander or its required habitat, and would not jeopardize its continued existence. Accordingly, we do not believe that further consultation is required, nor do we believe a biological assessment is necessary at this time.

If you agree with this assessment, please sign and date in the space provided below and fax a copy of this letter to me at (303) 969-2736 or mail a copy to me at the above address above within 30 days of your receipt of this letter. We would also welcome any comments or recommendations you may have regarding the proposed action or mitigation measures described above.

Please feel free to contact me by telephone at (303) 969-2297 or by e-mail at patrick_walsh@nps.gov.

Sincerely,



Patrick Walsh, Environmental Compliance Specialist
National Park Service, Denver Service Center
Transportation Division

Ms. Karen Mayne, Field Supervisor

Date

cc:

SHEN Gordon Olson



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
6669 Short Lane
Gloucester, VA 23061



Date: April 7, 2005

Project name: Skyline Drive Rehabilitation

Project number: 9212 City/County, VA Page + Rappahannock

The U.S. Fish and Wildlife Service (Service) has reviewed your request for information on federally listed or proposed endangered or threatened species and designated critical habitat for the above referenced project. The following comments are provided under provisions of the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*).

☒ We believe that the proposed action will not adversely affect federally listed species or federally designated critical habitat because no federally listed species are known to occur in the project area. Should project plans change or if additional information on listed and proposed species becomes available, this determination may be reconsidered.

☐ We recommend that you contact **both** of the following State agencies for site specific information on listed species in Virginia. Each agency maintains a different database and has differing expertise and/or regulatory responsibility:

Virginia Dept. of Game & Inland Fisheries
Environmental Services Section
P.O. Box 11104
Richmond, VA 23230
(804) 367-1000

Virginia Dept. of Conservation and Recreation
Division of Natural Heritage
217 Governor Street, 2nd Floor
Richmond, VA 23219
(804) 786-7951

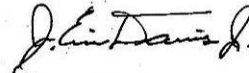
If either agency indicates a federally listed species **is present**, please resubmit your project description with letters from both agencies attached.

☐ If **appropriate habitat may be present**, we recommend surveys within appropriate habitat by a qualified surveyor. Enclosed are county lists with fact sheets that contain information the species' habitat requirements and lists of qualified surveyors. If this project involves a Federal agency (Federal permit, funding, or land), we encourage the Federal agency to contact this office if appropriate habitat is present and if they determine their proposed action may affect federally listed species or critical habitat.

_____ Determinations of the presence of waters of the United States, including wetlands, and the need for permits are made by the U.S. Army Corps of Engineers. They may be contacted at: Regulatory Branch, U.S. Army Corps of Engineers, Norfolk District, 803 Front Street, Norfolk, Virginia 23510, telephone (757) 441-7652.

Our website <http://virginiafieldoffice.fws.gov> contains many resources that may assist with project reviews. Point of contact is Eric Davis at (804) 693-6694, ext. 104.

Sincerely,

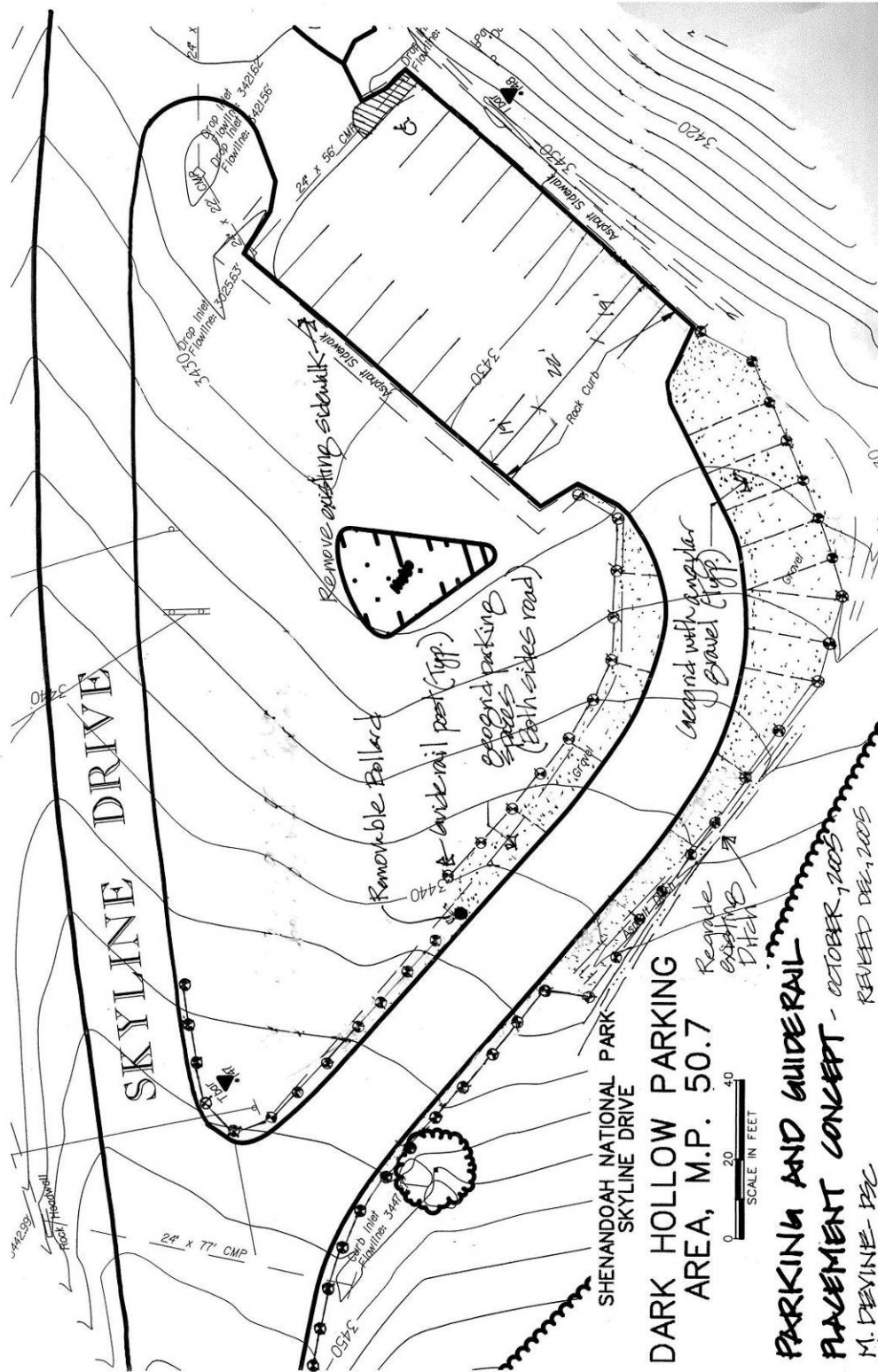


Karen L. Mayne
Supervisor
Virginia Field Office

Appendix B

New Parking Configuration at Dark Hollow and Limberlost Overlooks

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SHENANDOAH NATIONAL PARK
SKYLINE DRIVE

LIMBERLOST PARKING AREA

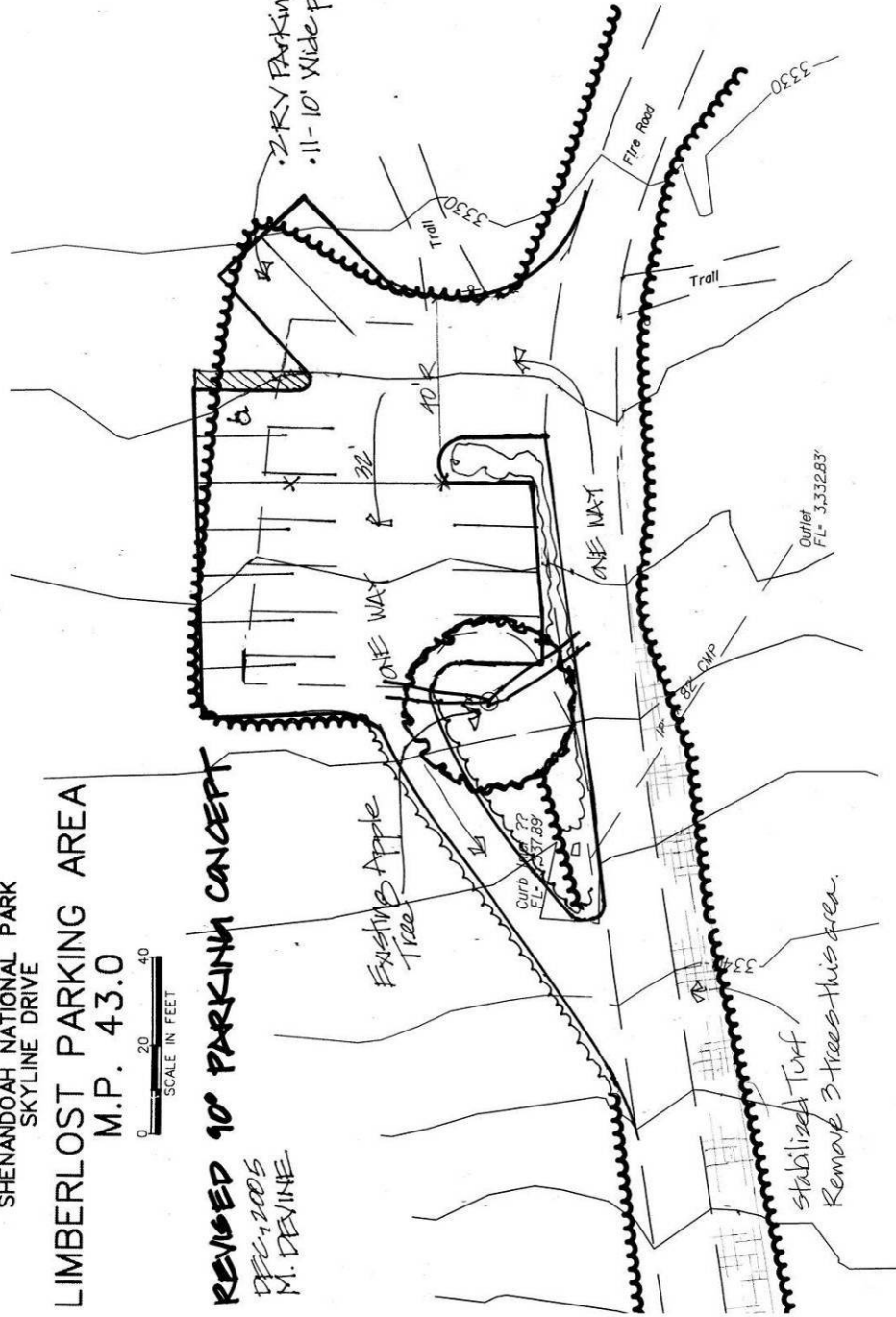
M.P. 43.0

0 20 40
SCALE IN FEET

REVISED 90° PARKING CONCEPT

DEC 2005
M. DEVINE

• 2 RV PARKING SPACES 30'x12'
• 11-10' Wide parking spaces



Appendix C

Initial 106 Consultation and Programmatic Agreement

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IN REPLY REFER TO:

United States Department of the Interior

NATIONAL PARK SERVICE
Shenandoah National Park
3655 U.S. Hwy. 211 East
Luray, Virginia 22835-9036

May 14, 2007

Ms. Ethel Eaton
Virginia Department of Historic Resources
2801 Kensington Avenue
Richmond, VA, 23321

Dear Ethel:

As per our recent telephone conversation, I enclose a 106 Case Report on the proposed Skyline Drive Overlook Rehabilitation project for five specific locations.

All of these overlooks are listed as contributory features in the National Register of Historic Places. All are highly significant because of their architectural and landscape architectural plans and details. We believe that these special features have been well documented and identified--they have been extensively photographed and measured and original CCC design drawings located where such exist. Missing historic features have been identified.

It is proposed that failing subsurface fill will be removed at three overlooks and the historic features reestablished after the slopes are stabilized. On the remaining two overlooks rehabilitation will be essentially replacement-in-kind. In all cases, every effort will be made to preserve what exists and to replace what is missing.

We believe that much of this work is, in fact, a categorical exclusion but believe consultation under section 016 of the Historic Preservation Act of 1966 (as amended) should be undertaken because of the extent of the work and the significance of the resource. We trust that you will concur that the work proposed as shown in the attached materials will not have an adverse effect on cultural resources.

Sincerely

Reed L. Engle
Cultural Resource Specialist

I concur with the determination that the rehabilitation of the five specified overlooks within the Skyline Drive Historic District will not have an adverse effect on cultural resources and will help preserve these features for future generations..


Virginia State Historic Preservation Officer

June 4, 2007
Date

PROGRAMMATIC AGREEMENT
BETWEEN THE NATIONAL PARK SERVICE
AND THE VIRGINIA DEPARTMENT OF HISTORIC RESOURCES
REGARDING
REHABILITATION OF HISTORIC OVERLOOKS ON SKYLINE DRIVE
SHENANDOAH NATIONAL PARK

WHEREAS Shenandoah National Park is a unit of the National Park Service (NPS) and is charged to meet the directives of the NPS Organic Act of 1916 (P.L. 64-235, 39 Stat. 535) to “conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations,” as it applies to the Skyline Drive; and

WHEREAS The NPS proposes to preserve/rehabilitate and restore many of the scenic overlooks on the Skyline Drive within the Skyline Drive Historic District (DHR inventory number 069-0234-0019), a property listed on the National Register of Historic Places and under consideration for National Historic Landmark status, in accordance with recommended treatments in the Secretary of the Interior’s *Standards and Guidelines for Federal Agency Historic Preservation Programs* and The Secretary of the Interior’s *Standards for Archeology and Historic Preservation* (the Project); and

WHEREAS The NPS has determined that the Project may have an effect on the character of the Skyline Drive Historic District, but that the large majority of the work proposed is replacement-in-kind, a nationwide programmatic exclusion under Stipulation IV B of the Nationwide Programmatic Agreement executed among the National Park Service (NPS), the Advisory Council on Historic Preservation (ACHP) and the National Conference of State Historic Preservation Officers effective October 1, 1995; and

WHEREAS Because of the large extent of the work and the fact that the work will be phased, possibly over a decade, the NPS has elected to consult with the SHPO in accordance with Section 106 of the National Historic Preservation Act, 16 U.S.C. Sect. 470 (NHPA) and its implementing regulations at 36 CFR Part 800.14 (b) (1) (2) to prepare this Programmatic Agreement (Agreement); and

WHEREAS the NPS has invited the ACHP to participate in this Programmatic Agreement pursuant to 36 CFR Part 800.6 (a)(1)(C)(iii), and ACHP has declined to participate; and

WHEREAS The field survey and research and architectural design has been completed for the rehabilitation of five overlooks, field survey completed for the remaining of the 69 overlooks, and various treatment alternatives considered and that the NPS has proposed that the "Preservation Alternative" is preferable to the "Engineering Alternative"; and.

WHEREAS The NPS has detailed the work to be accomplished on the first phase of the project (five overlooks) and has used these five overlooks to establish generic or prototypical treatments for the remaining overlooks, and;

WHEREAS The NPS has provided the SHPO with a "Preferred Alternative for Skyline Drive Overlooks", a spreadsheet showing proposed future rehabilitation/preservation treatment for future phases; and;

WHEREAS, The NPS will use the National Environmental Policy Act of 1969 (NEPA) process to involve the public regarding the Project through a series of meetings or public notices to and with

stakeholders to be held in the Fall 2007. In addition the NPS is in the process of preparing an Environmental Assessment (EA) to address future work on the overlooks on the Skyline Drive, which will include a draft of this PA as an APPENDIX for public review ; and

NOW, THEREFORE, National Park Service and the SHPO agree that upon the National Park Service's decision to proceed with the Project, the SHPO shall ensure that the following stipulations are implemented in order to take into account the effects of the Project on historic properties, and that these stipulations shall govern the Project and all of its parts until this Agreement expires or is terminated.

Stipulations

The National Park Service (NPS) shall ensure that the following stipulations are implemented:

- a. NPS shall assure that all significant features of the stone masonry of the guard/guide and retaining walls on the overlooks shall be replaced-in-kind. Such features will be photographically documented before work is initiated. The photographs shall be 8" by 10", black and white prints and meet current Virginia SHPO standards.
- b. Contractors shall be required to preserve significant masonry features (cap stones, unusual boulders incorporated into the overlook masonry, etc) and reinstall them in their original locations. Significant masonry pointing techniques or variances between styles from overlook to overlook shall be preserved.
- c. Requisite drainage improvements shall be as unintrusive as possible. Any improvements beyond routine measures shall be submitted to the SHPO for consultation.
- d. Whenever possible, missing historic features such as wood guiderails, shall be reconstructed.

II. Post Review Discoveries

- A. In the event that a previously unidentified archeological resource is discovered during ground disturbing activities, the NPS shall immediately notify the SHPO. All construction work involving subsurface disturbance will be halted in the area of the resource and in the surrounding area where further subsurface remains can reasonably be expected to occur. The NPS and the SHPO, or an archeologist approved by them, immediately will inspect the work site and determine the area and the nature of the affected archeological property. Construction work may then continue in the project area outside the site area. Within two working days of the original notification of discovery, the NPS in consultation with the SHPO will determine the National Register eligibility of the resource.
- B. If the resource is determined to meet National Register Criteria (36 CFR Part 60.6), the NPS will ensure compliance with Section 800.13 of the Advisory Council on Historic Preservation's regulations. Work in the affected area shall not proceed until either (a) the development or implementation of appropriate data recovery or other recommended mitigation procedures, or (b) the determination is made that the located remains are not eligible for inclusion on the National Register.

III. Dispute Resolution

- A. Should any party to this Agreement object in writing to the NPS regarding any action carried out or proposed with respect to any undertakings covered by this Agreement or to implementation of this Agreement, the NPS will consult with the objecting party to resolve the objection.
- B. At any time during implementation of the measures stipulated in this Agreement, should an objection pertaining to this Agreement be raised by a member of the public, the NPS shall notify the parties to this Agreement and take the objection into account, consulting with the objector and, should the objector so request, with any of the parties to this Agreement to resolve the objection.

IV. Amendments and Termination

- A. The NPS shall provide an annual status report to the SHPO to review implementation of the terms of this Agreement and to determine whether amendments are needed. If amendments are needed, the signatories to this Agreement shall consult, in accordance with Stipulation IV. B of this Agreement, to make such revisions. The first status report shall be one year after the date this agreement is ratified.
- B. Any party to this agreement may propose to the NPS that the Agreement be amended, whereupon the NPS will consult with the other parties to this Agreement to consider such an amendment. All signatories to the Agreement must agree to the proposed amendment in accordance with 800.6(c)(7).
- C. If the NPS determines that it cannot implement the terms of this Agreement, or if the NPS or SHPO determines that the Agreement is not being properly implemented, the NPS or the SHPO may propose to the other party to this Agreement that it be amended or terminated.
- D. This Agreement may be terminated by any signatory to the Agreement in accordance with the procedures described in 800.6(c)(8). Termination shall include the submission of a technical report by the NPS on any work done up to and including the date of termination.

V. Duration of Agreement

This Agreement will continue in full force and effect until ten (10) years *after* the date of the last signature. At any time in the six-month period prior to such date, the NPS may request the SHPO to consider an extension or modification of this Agreement. No extension or modification will be effective unless all parties to the Agreement have agreed with it in writing.

Execution of this Agreement by the National Park Service and the Virginia State Historic Preservation Officer, and its submission to the Advisory Council on Historic Preservation in accordance with 36 CFR 800.6(b)(1)(iv), shall, pursuant to 36 CFR 800.6(c), be considered to be an Agreement with the ACHP for the purposes of Section 110(l) of NHPA. Execution and submission of this Agreement, and implementation of its terms evidence that the National Park Service has afforded the ACHP an opportunity to comment on the Project and its effects on historic properties, and that the National Park Service has taken into account the effects of the Project on historic properties.

Shenandoah National Park, National Park Service

By:_____ Date:_____

Chas Cartwright, Superintendent, Shenandoah National Park, National Park Service

Virginia Department of Historic Resources

By:_____ Date:_____

Kathleen Kilpatrick, Virginia State Historic Preservation Officer

As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering wise use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historic places, and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people. The department also promotes the goals of the Take Pride in America campaign by encouraging stewardship and citizen responsibility for the public lands and promoting citizen participation in their care. The department also has major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

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