U.S. Department of the Interior
National Park Service

Blue Ridge Parkway
Wilkes County, North Carolina

REPAIR OF UNSTABLE ROADBED AT MILEPOST 270.3

Environmental Assessment

February 2007

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SUMMARY

The National Park Service (NPS) has decided to prepare an Environmental Assessment for the repair of approximately 200 linear feet of unstable roadbed on the Blue Ridge Parkway at Milepost 270.3. This project consists of the remediation of an active fill embankment slide that has experienced frequent instability since approximately the mid-1970's. The intent of this project is to develop corrective measures that will either arrest the slide movement to stabilize the slope using a system of anchor blocks or to stabilize the road bed by spanning the slide with a bridge. The project will alleviate continuing safety concerns and maintenance efforts on this portion of the Parkway. The purpose of this Environmental Assessment is to describe the affected environment and analyze potential impacts associated with a No Action Alternative and three action alternatives.

The preferred alternative, which would construct an anchor block system to stabilize the slope, would have no impact on air quality, floodplains, soundscape, archeological resources, ethnographic resources, historic and prehistoric structures, museum collections, socioeconomic environment, prime and unique farmlands, and environmental justice. Impacts to soils would be minor and adverse in the short-term and negligible and adverse in the long-term. Impacts to water resources, including wetlands, would be minor and adverse in the short-term. Impacts to vegetation would be minor and adverse in the short-term. Impacts to wildlife would be minor and adverse in the short-term. Impacts to visitor use and experience would be minor and adverse in the short-term. Impacts to cultural landscapes would be negligible and adverse in the short-term. Impacts to human health and safety would be moderate and beneficial in the long-term.

Note Regarding Public Comment

If you wish to comment on the Environmental Assessment, you may do so online (our preference) at the National Park Service website "Planning, Environment, and Public Comment" *http://parkplanning.nps.gov*, or you may mail comments to: Blue Ridge Parkway, Attn: Suzette Molling, Environmental Protection Specialist;; 199 Hemphill Knob Road; Asheville, North Carolina 28803.

This Environmental Assessment will be on public review for 30 days. Our practice is to make comments, including names, home, addresses, home phone numbers, and email addresses of respondents, available for public review. Individual respondents may request that we withhold their names and/or home addresses, etc., but if you wish to consider withholding this information you must state this prominently at the beginning of your comments. Commentators using the website can make such a request by checking the box "keep my contact information private." Comments are typically treated as a public record and made available for public review. Individuals may request that the National Park Service withhold their name and address from disclosure. Such requests will be honored to the extent allowable by law.

TABLE OF CONTENTS

Item **Page**

LIST OF FIGURES

LIST OF TABLES

ACRONYMS AND ABBREVIATIONS

BLRI	Blue Ridge Parkway
BMP	Best Management Practices
CBA	Choosing by Advantages
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
DSC	Denver Service Center
DO	NPS Director's Order
EA	Environmental Assessment
EFLHD	Eastern Federal Lands and Highway Division
FHWA	Federal Highways Administration
FLHP	Federal Lands Highway Program
FPPA	Farmland Protection Policy Act
FY	Fiscal Year
MP	Milepost
NCDENR	North Carolina Department of Environment and Natural Resources
NEPA	National Environmental Policy Act
NHL	National Historic Landmark
NHPA	National Historic Preservation Act
NPS	National Park Service
OL	Overlook
ORW	Outstanding Resource Waters
SERO	Southeast Regional Office
T&E	Threatened and Endangered
USC	United States Code
USACE	United States Army Corps of Engineers
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
VA	Value Analysis

PURPOSE AND NEED

PURPOSE AND NEED FOR ACTION

The National Park Service (NPS) has decided to prepare an Environmental Assessment (EA) for the repair of approximately 200 linear feet of unstable roadbed on the Blue Ridge Parkway (BLRI or Parkway). The site is approximately six miles north of US 421 and Deep Gap at Milepost (MP) 270.3, Section 2E, in Wilkes County, North Carolina near West Jefferson (Figure 1). This project consists of the remediation of an active fill embankment slide that has experienced frequent instability since approximately the mid-1970's. This EA will analyze alternatives and the resulting decision will establish the repair solution for this unstable roadbed.

The Blue Ridge Parkway is the most frequently visited National Park Service area with an annual visitation of over 21 million visitors. The Parkway road inventory consists of over 525 lineal miles of asphalt pavement located at elevations that in some areas exceed 5,000 feet above sea level. All road areas are subject to extreme weather conditions, including freezing and thawing, which causes rockslides and other surface failures. As the slide area that is the cause of the unstable road bed at MP 270.3 continues to move, the roadway embankment shifts, thus causing the roadbed to settle and to damage the pavement surface. The two reasons the fill is moving are that the fill is placed on an existing steep rock slope without proper benching of the rock slope, and that the existing rock slope is yielding subsurface water at the interface of the fill and the rock slope, lubricating the fill material and causing the fill to move at the interface of the existing rock slope and the fill. As water continues to penetrate the structural foundation of the road base, deterioration is accelerated.

The short section of Parkway at MP 270.3 has high potential for catastrophic failure and is rated a traffic safety problem due to uneven pavement caused by continued settlement. Visitor complaints of near accidents have been received as the underlying slope and fill materials continue to move and road surfaces deteriorate. As a result this area is considered an extremely high priority. Efforts to repair the road have been made intermittently for the past 30 years. None has proven effective, and it may be necessary to stabilize the section by using an anchor block system or by constructing a short bridge.

The intent of this project is to develop corrective measures that will either arrest the slide movement to stabilize the slope or stabilize the road embankment, and will alleviate continuing safety concerns and maintenance efforts on this portion of the Parkway.

PROJECT BACKGROUND

The two lanes of pavement at this location are supported by a deep embankment fill placed during the original Parkway construction. The site borders on a major hillside with more than 100-feet of relief between the top and bottom of the embankment fill slope and has a slope angle of approximately 1.5 horizontal to 1.0 vertical.

The travel way is located on a relatively level bench near elevation 3,300 feet with the hillside continuing upward starting about 50-feet west of the Parkway pavement. The top of the slide opens up approximately 20 feet west of the Parkway pavement. A steep downhill slope starts approximately 5-feet east of the pavement and extends to well beyond the project limits. The bottom of the slide is reported to be approximately 150 feet down the slope at an elevation approximately 80 to 90-feet lower than the Parkway (NPS, 2005a). Based on the cracking observed on the pavement, it is estimated that the horizontal length of the slide area is approximately 190-feet near the top at the roadway.

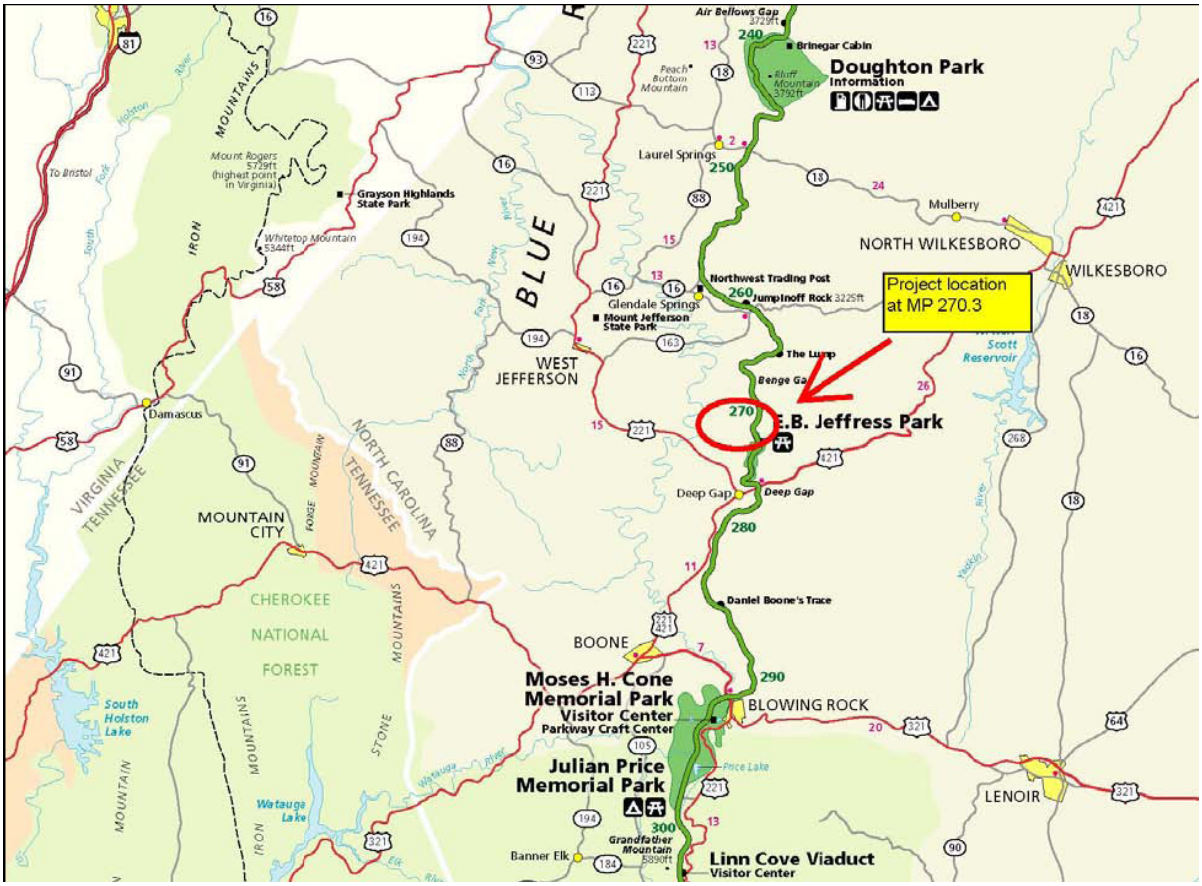

Figure 1. Blue Ridge Parkway and vicinity map showing the project location.

A tract of land bordering the Parkway which was recently acquired expands the boundary in the location of the slide at MP 270.3 from 350 feet to a total of approximately 750 feet to bordering private land. The entire tract would expand the boundary much wider, but there is a "donut hole" of private land contained within the newly acquired tract (Figure 2).

The roadbed movement at MP 270.3 has been active since the spring of 1975. A horizontal subsurface drainage system was installed in the late 1970's and twice in the 1980's to remove subsurface drainage beneath fill soils, believed at the time to be the main cause of the movement. The pavement has been patched and reconstructed numerous times to remove pavement dips caused by settlement, but movement and pavement settling continue.

In 1992 in another attempt to stabilize the area, a drilled shaft/horizontal drainage gallery was installed and the pavement was repaired. The system performed well for several years, but movement was reactivated in 1995 with up to five inches of settlement within a two-year period.

Eastern Federal Lands and Highway Division (EFLHD) personnel conducted an inspection of the landslide in May 1997. At that time, of the 16 horizontal drains installed in 1992 as part of the drainage gallery, four were running water and three were dripping. Recommendations were given to seal the pavement cracks and restore the Parkway grade by placing an asphaltic concrete patch. Further recommendations were given to install piezometers to measure water levels and to drill into one of the drainage shafts to determine if they were becoming clogged. EFLHD personnel installed piezometers in July 1997. Drainage shafts have not been drilled.

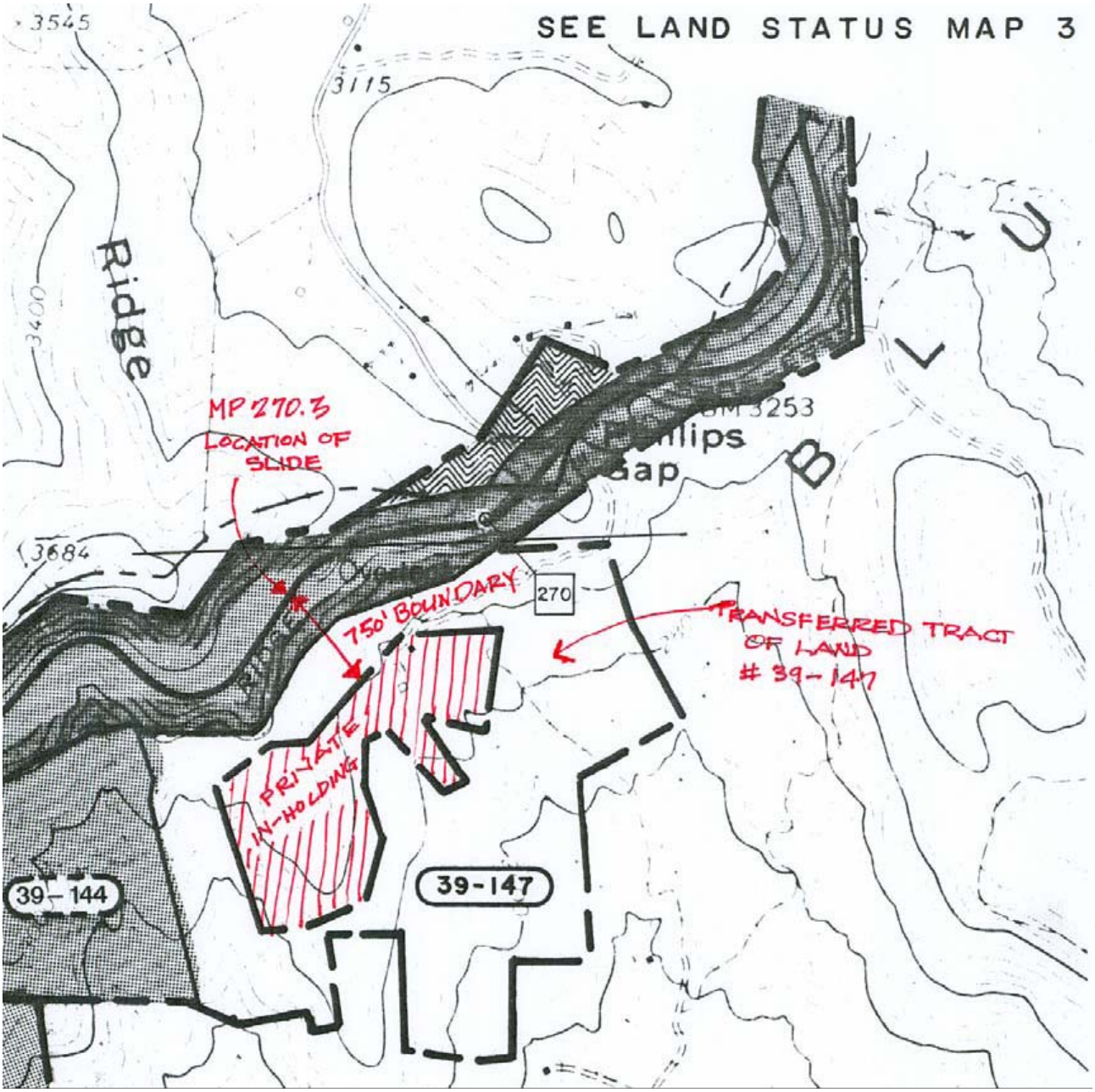

Figure 2. Land Tract Number 39-147 recently transferred to Parkway ownership from the Conservation Land Trust.

Two adjacent areas of roadway, approximately 85 feet apart, have been patched since 1997. Both patched areas are the full width of the roadway. The south and north patches are approximately 25 feet and 60 feet long, respectively. Another patch, 6 feet wide by 56 feet long, extends south from the north patch. An inspection of the 16 horizontal drains installed in 1992 revealed that they have been removing an average of approximately two gallons of water per minute from beneath the slide area. However, a number of trees along the lower portion of the fill slope began to lean, geotechnical monitoring of the area indicates continual slope movement, and catastrophic failure of the slope is considered highly possible.

Recent geotechnical testing and analysis reveal that water movement at the interface of bedrock and soil is a critical contributing cause of roadway movement since it can reduce frictional resistance of the embankment thus aiding in its instability. However, the weight of the material on the interface between bedrock and soil exceeds the frictional resistance of that interface and is believed to be a major cause of slide movement. If it were not for the existing rock slope yielding subsurface water at its interface with the fill, it is likely that the fill would not be moving. As past attempts to arrest the movement have proven to be ineffective, more advanced geotechnical repair solutions must be proposed.

PARK PURPOSE AND SIGNIFICANCE

The legislated purpose of BLRI, under the Act of June 30, 1936, is to link Shenandoah National Park in Virginia and the Great Smoky Mountains National Park in North Carolina and Tennessee by way of a recreation-oriented motor road intended for public use and enjoyment. Under the provisions of the Organic Act approved by Congress on August 25, 1916 (39 Stat. 535) creating the National Park Service, the intended purpose of the BLRI is to provide an elongated park to conserve, interpret, and exhibit the unique natural and cultural resources of the central and southern Appalachian Mountains, as well as provide for leisure motor travel through a variety of scenic environments.

The general interpretation of BLRI's purpose has been further refined into the following more specific purpose statements:

- Connect Shenandoah and Great Smoky Mountains National Parks by way of a "national rural parkway" – a recreational, destination-oriented motor road traveling through a variety of scenic ridge, mountainside, and pastoral farm landscapes.

- Conserve the scenery and preserve the natural and cultural resources of the Parkway's designed and natural area to preserve the integrity of resources and to provide a quality visitor experience.

- Influence the protection of the scenic, natural and cultural resources within the corridor composed of those lands that are visible from the Blue Ridge Parkway and/or situated adjacent to the boundary.

- Provide for public enjoyment and understanding of the natural resources and cultural heritage of the central and southern Appalachian Mountains.

- Provide opportunities for high quality scenic and recreational experiences along the Blue Ridge Parkway and within the corridor through which it passes.

The route of the Blue Ridge Parkway follows mountain and valley landscapes to link Shenandoah and Great Smoky Mountains National Parks. Its location was selected to provide the best in a variety of scenic, historic, and natural features that evoke the regional image of the central and southern Appalachian Mountains. In order to maximize scenic views and give Blue Ridge Parkway visitors the impression that they are in a park with boundaries to the horizon, the Blue Ridge Parkway was located in mountainous terrain that normal roads would have avoided. The Blue Ridge Parkway was the first national rural parkway and is widely recognized as an international example of landscape and engineering design achievements with a roadway that lies easily on the land and blends into the existing scene. The Blue Ridge Parkway also was the first national rural parkway to be conceived, designed, and constructed as a leisure-type driving experience.

The Blue Ridge Parkway follows the crests and ridges of the Blue Ridge, Black, Great Craggy, Great Balsam and Plot Balsam Mountains. These five major mountain ranges are part of the central and southern Appalachian Mountains. The 469 mile Parkway encompasses several geographic and vegetative zones, with altitudes ranging from approximately 650 feet at James River in Virginia to nearly 6,050 feet at Richland Balsam in North Carolina. The Blue Ridge Parkway is known for spectacular mountain and valley vistas, quiet pastoral scenes, sparkling waterfalls, colorful flowers and foliage displays, and interpretation of mountain history and culture. Its varied topography and numerous vista points offer easy public access to views of southern Appalachian rural landscapes and forested mountains. Designed for recreational driving, the Blue Ridge Parkway provides visitors with quiet, leisure travel, free from commercial traffic and the congestion of high-speed highways. As its All-American Road status indicates, it is one of the most diverse and high quality recreational driving experiences in the world.

The Blue Ridge Parkway is the highest and longest continuous route in the Appalachian area. Because of its long length, proximity to large Eastern United States urban areas, numerous access points, quality design and diversity of scenic, natural and cultural resources, the Blue Ridge Parkway is the most visited National Park Service area.

LAWS, REGULATIONS, AND POLICIES

The following laws and associated regulations provided guidance for the development of this EA, design of the preferred alternative and alternatives, analysis of impacts, and creation of mitigation measures to be implemented as part of the preferred alternative.

The NPS Organic Act (1916) and the General Authorities Act (1970) prohibit impairment of park resources and values. The NPS 2001 Management Policies uses the terms “resources and values” to mean the full spectrum of tangible and intangible attributes for which the park was established and is managed, including the Organic Act’s fundamental purpose and any additional purposes as stated in the park’s establishing legislation. The impairment of park resources and values may not be allowed unless directly and specifically provided by statute. The primary responsibility of the NPS is to ensure that park resources and values will continue to exist in a condition that will allow the American people to have present and future opportunities to enjoy them.

The evaluation of whether impacts of a preferred alternative would lead to an impairment of park resources and values is included in this EA. Impairment is more likely when there are potential impacts to a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- essential 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 GMP or other relevant NPS planning documents.

NPS Management Policies 2001 (NPS, 2000) addresses transportation systems, including park roads, emphasizing that the NPS must find transportation solutions that preserve the natural and cultural resources while providing a high-quality visitor experience.

Section 9.2 Transportation Systems “If a decision is made to construct, expand, or reconstruct a park transportation system, the Service will address the need for terrestrial and aquatic wildlife corridor crossings and other accommodations to avoid or mitigate harm to individual animals, the fragmentation of plant and animal habitats, and the disruption of natural systems.”

Section 9.2.1.1 Park Roads "Park roads will be well constructed, sensitive to natural and cultural resources, reflect the highest principles of park design, and enhance the visitor experience. Park roads are generally not intended to provide fast and convenient transportation; rather, they are intended to enhance the quality of a visit, while providing for safe and efficient travel, with minimal 106 or no impacts on natural and cultural resources."

SCOPING

Scoping is an open process that determines the breadth of environmental issues and alternatives to be addressed in an EA. Scoping involves obtaining internal and external input on project-related issues from resource specialists and the public, respectively. The Park conducted internal scoping with appropriate NPS (BLRI, SERO, and DSC) and FHWA staff and external scoping with the public, including interested and affected groups or individuals and non-NPS agency personnel.

An interdisciplinary team comprising BLRI, SERO, DSC, and FHWA staff members contributed to the internal scoping process. This process resulted in definition of the purpose and need, identification of potential actions to address the need, and determination of what the likely issues and impact topics would be.

For external scoping, a public scoping letter, a public scoping brochure, and a news release (see Figures A-1 through A-3 in Appendix A) describing the project and requesting public input on the proposed alternatives was issued to private parties and State, Federal, and local agencies on June 1, 2006. Appendix A provides a list of individual and agencies/organizations that were sent the scoping letter (Table A-1). The external scoping period ended on July 3, 2005. Comments received during the Scoping period can be found in Figures A-4 to A-7 of Appendix A.

THE ENVIRONMENTAL ASSESSMENT

This environmental assessment (EA) analyzes the environmental impacts that would result from the alternatives considered, including the No Action Alternative. This EA has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 United States Code (USC) 4321 et seq.), the Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations (CFR) 1500 through 1508) for implementing NEPA, and the NPS NEPA compliance guidance handbook (DO-12, *Conservation Planning, Environmental Impact Analysis, and Decision-making*).

IMPACT TOPICS

Issues and concerns with this project are grouped into distinct impact topics to aid in analyzing environmental consequences, which allows for a standardized comparison of alternatives based on the most relevant information. The impact topics were identified on the basis of federal laws, regulations and orders, *NPS Management Policies 2001*, and NPS knowledge of potentially affected resources. A brief rationale for selecting or dismissing each topic is provided below.

Impact Topics Analyzed in this Environmental Assessment

Soils and Geology
Construction activities, such as excavation and the use of heavy equipment, would disturb soils and potentially cause soil compaction and erosion in the project area. Soil grading and other construction related activity could permanently change the character of the soil.

Water Resources, Including Wetlands
NPS *Management Policies 2001* requires protection of water quality consistent with the provisions of the Clean Water Act of 1977, a national policy to restore and maintain the chemical, physical, and biological integrity of the nation's waters and to prevent, control, and abate water pollution. Section 404 of the Clean Water Act authorizes the U.S. Army Corps of Engineers (USACE) to prohibit or regulate, through a permitting process, the discharge of dredged or fill material into U.S. waters. Executive Order 11990, *Protection of Wetlands*, NPS *Management Policies 2001*, Section 4.6.5, *Wetlands*, and NPS DO #77-1, *Wetland Protection*, require an examination of impacts to and protection of wetlands. A small perennial stream with adjoining wetlands occurs below the road at MP 270.3. Construction activities have the potential to affect water quality and wetlands in the project area.

Vegetation
Vegetation along the roadside could be impacted both from clearing and from trampling during construction. The spread of invasive plants may occur. There are no federally listed threatened or endangered plants in the vicinity of MP 270.3.

Wildlife, Including Threatened and Endangered Species
Clearing vegetation could potentially reduce or alter wildlife habitat. Construction activities could temporarily displace wildlife from the immediate vicinity. There are no federally listed threatened or endangered animals in the vicinity of MP 270.3. However, cerulean warblers (*Dendroica cerulea*) a federal species of concern, and significantly rare in North Carolina, are known to breed within 0.5 miles of this site.

Visitor Use and Experience, Including Recreation and Visual Resources
Visitor use and experience could be affected through noise, aesthetic, and traffic-related effects during construction. Visual resources would be affected by construction activities and after construction by changes to the road configuration. Recreational opportunities could be affected by changes in traffic patterns and conditions along the roadway.

Cultural Landscapes
Cultural landscapes are defined by the NPS as "a reflection of human adaptation and use of natural resources and is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built. The character of a cultural landscape is defined both by physical materials, such as roads, buildings, walls, and vegetation, and by use reflecting cultural values and traditions" (DO #28: Cultural Resource Management Guideline, 1998). Although the project area is not located in an historic district, the Parkway itself is considered historically significant and is eligible for designation as a National Historic Landmark. This project could replace historic features/elements in kind.

Human Health and Safety
Safety along the Parkway at MP 270.3 would improve with road repairs as the current safety hazards would be eliminated.

Impact Topics Dismissed from Further Consideration

Air Quality
Air quality could be impacted during the construction phase of the project; however, impacts would be temporary and minor in intensity. Overall, there could be a slight and temporary degradation of local air quality due to dust generated by activities and emissions from construction equipment. These effects would last only during construction activities. Best Management Practices (BMPs) would be utilized to limit dust generation and dispersal. To keep equipment emissions down, equipment would be properly maintained. Therefore, air quality was dismissed as an impact topic in this document.

Floodplains
Executive Order 11988, *Floodplain Management*, requires all Federal agencies to take action to reduce the risk of flood loss, to restore and preserve the natural and beneficial values served by floodplains, and to minimize the impact of floods on human safety, health, and welfare. The proposed project area is not located near or in any floodplains; therefore this topic was dismissed from consideration.

Soundscape
In accordance with NPS *Management Policies 2001*, the Parkway strives to preserve the natural soundscape. The soundscape could be impacted during the construction phase of the project; however, impacts would be temporary and minor in intensity. The proposed action would not affect natural ambient sound in the long-term. Therefore, soundscape was dismissed as an impact topic in this EA.

Archeological Resources
The National Park Service is required to, "preserve collections of prehistoric and historic material remains, and associated records, recovered under the authority of the Antiquities Act (16 U.S.C. 431-433), the Reservoir Salvage Act (16 U.S.C. 469-469c), section 110 of the National Historic Preservation Act (16 U.S.C. 470h-2), or the Archaeological Resources Protection Act (16 U.S.C. 470aa-mm)" (36 CFR Part 79). These regulations, promulgated under the authority of the Secretary of Interior, apply to findings made by historic preservation professionals that meet qualification standards for Federal projects. As no archaeological sites are located in the project area, archaeological resources were dismissed as an impact topic in the EA.

Ethnographic Resources
The National Park Service must be respectful of ethnographic resources, those cultural and natural features that are of traditional significance to traditionally associated peoples. These are contemporary peoples whose interest in the park began prior to its establishment (1936) and who have associated with the park for more than two generations (40 years) (*Management Policies 2001*, Sec. 5.3.5.3). The proposed project would not affect any ethnographic resources currently known to park staff, and thus will not be discussed as an impact topic.

Historic and Prehistoric Structures
The National Historic Preservation Act (NHPA), as amended in 1992 (16 USC 470 *et seq*.); NEPA of 1969 (42 USC 4321 *et seq*.); NPS DO #28, *Cultural Resource Management Guideline*, NPS *Management Policies 2001*, and NPS DO #12, *Conservation Planning, Environmental Impact Analysis, and Decision Making* require the consideration of impacts on historic structures and buildings listed in or eligible for listing in the National Register of Historic Places. No structures, historic or prehistoric, are directly involved in this project, and thus, this topic has been dismissed.

Museum Collections

The NPS' *Management Policies, 2001* and DO #28, *Cultural Resource Management Guideline* require the consideration of impacts on museum collections (historic artifacts, natural specimens, and archival and manuscript material). There are no museum objects that would be affected by this proposal, and thus was dismissed as an impact topic.

Socioeconomic Environment

Construction activities associated with the action alternative would have short-term, negligible impacts on the local economy due to short-term increases in employment opportunities and revenues for local businesses and government during construction. A private construction contractor would be hired by the FHWA to conduct construction activities. The construction contract would be administered by FHWA with representation by the National Park Service, Denver Service Center. Construction-related benefits to the local economy through wages, overhead expenses, material costs, and profits would last only the duration of construction, and would be minimal. Parkway closure and detour routes during construction may have an adverse impact to local businesses. No long-term impacts on the local economy would occur as a result of the project. Therefore, this topic was dismissed from further analysis in this EA.

Prime and Unique Farmlands

In August 1980, the CEQ directed that Federal agencies must assess the effects of their actions on farmland soils classified by the U.S. Department of Agriculture's Natural Resources Conservation Service as prime or unique. Prime or unique farmland is defined as soil that particularly produces general crops, such as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops, such as fruits, vegetables, and nuts. Since the project area does not meet the definition of farmland as stated in Title 7, Chapter 73, Section 4201 (c)(1) of the Farmland Protection Policy Act (FPPA), it is not applicable to the FPPA. Therefore, the topic of prime and unique farmlands was dismissed as an impact topic in this EA.

Environmental Justice

Presidential Executive Order 12898, *General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires all Federal agencies to incorporate environmental justice into their missions by identifying and addressing the disproportionately high and/or adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. The proposed project would not have disproportionate health or environmental effects on minorities or low-income populations or communities as defined in the US EPA's Draft Environmental Justice Guidance (July 1996). Therefore, Environmental Justice was dismissed as an impact topic in this EA.

ALTERNATIVES CONSIDERED

CEQ regulations for implementing NEPA require that Federal agencies explore and objectively evaluate all reasonable alternatives to the preferred alternative, and to briefly discuss the rationale for eliminating any alternatives that were not considered in detail. This chapter describes a range of reasonable alternatives, including the No Action Alternative, Preferred Alternative, two other action alternatives, and an alternative that was considered and eliminated from further analysis.

In an effort to select the best alternative the National Park System uses a selection and ranking process that is based on the relative advantages and costs of each project in accomplishing service-wide goals and objectives. This process is called Choosing by Advantage (NPS, 1999). In using the Choosing by Advantage (CBA) process, the National Park Service asks itself "what and how large are the advantages of each project" proposed for consideration, "how important are the advantages of the projects", and finally "are those advantages worth their associated cost". Projects then compete against each other in the CBA process that evaluates all the projects relative to the following factors, which reflect the National Park Service mission:

- Protect cultural and natural resources
- Provide for visitor enjoyment
- Improve efficiency of park operations
- Provide cost-effective, environmentally responsible, and otherwise beneficial development for the National Park Service.

The results reflect total benefits of each project toward achieving the National Park Service mission. Cost is then introduced to the priority setting process, establishing an importance to cost ratio. The resulting priorities represent those projects which provide the greatest benefit to the National Park Service for each dollar spent.

The CBA process was conducted at the Holiday Inn Express in Boone, North Carolina July 26-28, 2005. The details and outcome of the CBA process are described in Appendix B.

ALTERNATIVE A – NO ACTION

Under the No Action Alternative, the unstable roadway at MP 270.3 would be left as is (Figure 3), roadbed movement would continue due to the slow moving slide, and the road would not be substantially repaired. However, this alternative would require continued cyclic maintenance to keep the road operational. CEQ regulations (40 CFR 1502.14) require the assessment of the No Action Alternative in NEPA documents. The No Action Alternative provides a basis for comparing the management direction and environmental consequences of the other action alternatives and must be considered in every EA.

Figure 3. The No Action Alternative: current road conditions at MP 270.3.

ALTERNATIVE B – ANCHOR BLOCKS (NPS PREFERRED ALTERNATIVE)

Under Alternative B, the area around the unstable roadbed would be retained with an anchor block system. The active slope would be stabilized using concrete anchor blocks with tendons anchored to rock beneath the slip plane. The anchor block system would be installed on slopes below the Parkway and may include installation of additional subsurface drainage beneath Parkway fill embankment and pavement. The 2008 cost estimate for this alternative is $2.7M.

Anchor blocks would be completely buried and placed in a zone below the Parkway to the east between 30 and 200 feet from the road edge. The conceptual design for the anchor block system has not been completed other than the representation of the area of disturbance (Figure 4). A conceptual description of the anchor block system, subject to revision, follows. Placement could involve placing four or five rows of evenly spaced concrete anchor blocks located one-third to one-half way up the slope from the toe of the slide. There could be a total of eighty-eight to ninety-six 8'x8' or 10'x10' blocks. Each row could be approximately 25 to 40 feet apart and the area of coverage could be 200 feet long by 150 feet deep. Each row could likely have 20 to 24 anchor blocks. The anchor blocks would be placed in a wedge excavated from the slope so that a leveled bench can be created. Once the anchor blocks are placed in rows in an upright position with rock anchor cables in place, the slope wedges with the anchor blocks would be covered over with fill soils, topsoil, and seeded with grass. Anchor blocks would be stabilized by a heavy cable that would be drilled down and into competent rock outside of the slide zone.

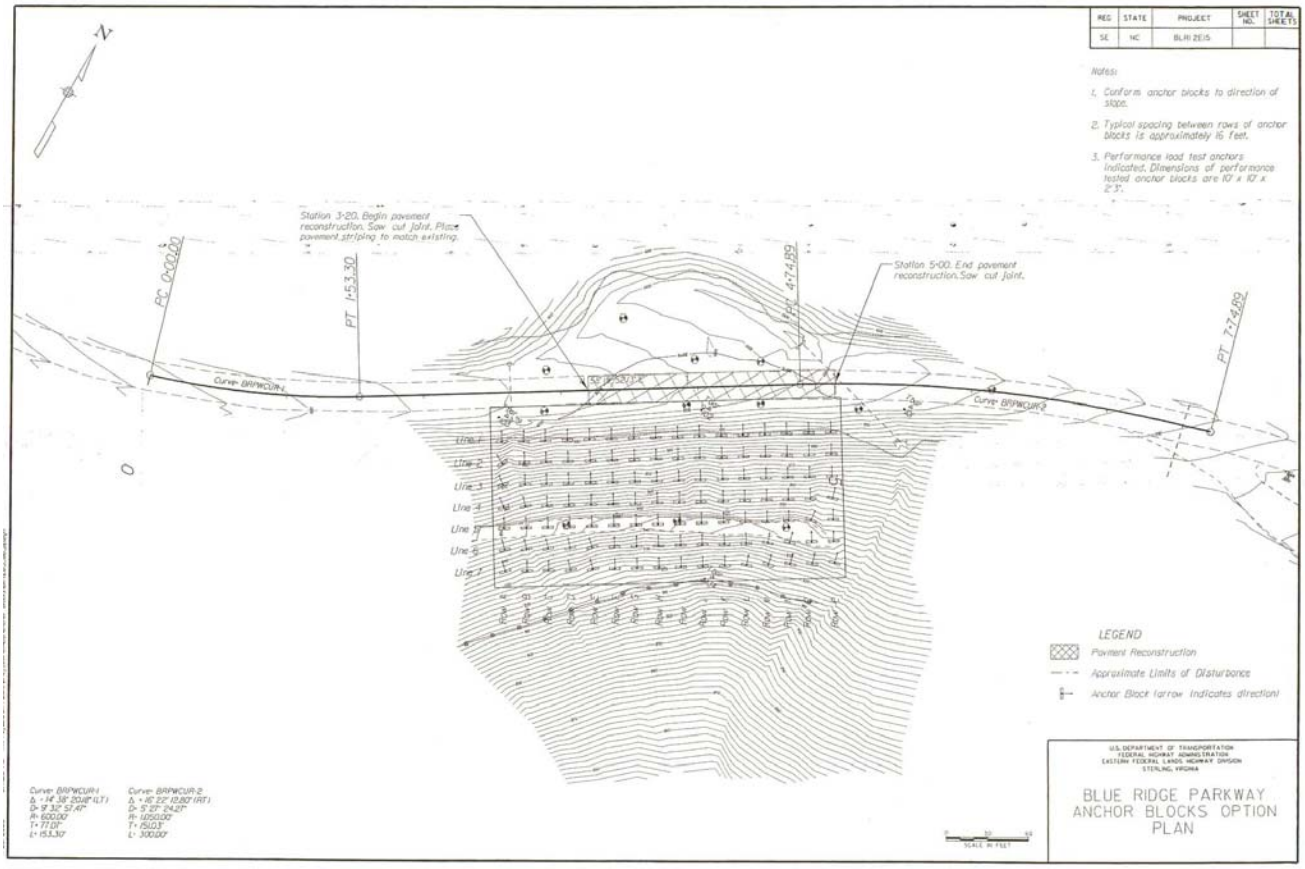

Figure 4. Alternative B: example of anchor block system installed at other slide area sites with similar geotechnical analysis.

Subsurface drain piping has been installed in the past that remains in place today, with the intent to drain off some of this subsurface water from beneath the Parkway. The current under-drainage PVC pipes vary in diameter, with most being 1" to 2", and are placed over bedrock and beneath the fill soil layer where it is believed most of the subterranean water flow is. This system of piping is meant to collect the water from this plane of flow and redirect it to daylight on the face of the slope or into spring boxes then to the face of the slope. The underdrain pipes that discharge in the spring boxes are directionally drilled towards 34 each 36 inch diameter vertical shafts which are backfilled with aggregate that aide in directing water flow to the underdrain piping.

The existing under-drain piping system may need to be upgraded and/or replaced in the anchor block system alternative because drainage relief is inadequate to prevent slide movement. An observed flow rate from individual outlet pipes has been observed to be approximately 2 gallons per minute. The proposed anchor blocks to be installed would likely damage or completely destroy the existing piping and outlet distribution of the existing system of piping since the location of this piping is not known. If additional subsurface drainage piping is to be included it would be of a design similar to the existing system. There would only be piping installed to collect and redirect subsurface drainage at the fill slope slip plane (between fill and competent rock) as does the existing piping system and there shall be no aggregate filled trenches that feed the under drain piping, which is not considered geotechnically feasible. Additional drainage piping may need to be installed on both the cut (Pkwy R) and fill slopes (Pkwy L) depending on updated and final geotechnical analysis and design development of the anchor block system. If geotechnical analysis can validate that the anchor block system can completely subside further slide movement with repairs to the existing subsurface piping system alone, then the anchor block system

would be installed retaining the existing subsurface drainage pipe system, making repairs to pipe only where necessary. However, every effort would be made to retain the integrity of the existing subsurface drainage.

Subsurface drainage relief is considered an asset and facilities to capture surface drainage may be included in detailed design of the anchor block system if deemed necessary and could contribute to the future stability of the slope. However, it is not at this time considered a geotechnical necessity in the anchor block system design. If the subsurface drainage system is extended, replaced, or repaired, additional excavation or area disturbance would not be expanded.

The subsurface drainage system would continue to be evaluated with the design of the anchor block system to ensure a sustainable geotechnical solution to stabilizing the slide from further movement. A means of reducing the contributing causes for slide movement should provide the ideal geotechnical engineering solution. The anchor block system would retain the slope embankment and the subsurface drainage piping would redirect and reduce subsurface water flow at the plain of movement between the embankment and bedrock. Additional geotechnical analysis would be necessary to demonstrate that the anchor block system is in itself an adequate solution to stabilizing slide movement. Additional analysis would determine any need to increase the amount of or otherwise make improvements to the existing subsurface drainage piping system.

Surface drainage would be handled by a system of culverts to channel flow, much as it is in most other areas on the Parkway. For the anchor block system, culverts beneath the Parkway would channel run off from natural drainage swales. The existing culvert system design (size, construction, material, and placement) may be adequate, but replacing defective culvert may be necessary.

The roadway is to be reconstructed within the slide zone. The existing pavement is in disrepair due to continued settling and movement of the slide. Additionally, the approaches to the reconstructed pavement would be milled. Reconstruction would involve repaving the road surface with little disturbance to roadway subgrade, although it would be subject to erosion for a short time. The asphalt would be disposed of properly.

Because of the weight, anchor blocks would be staged and stored off the Parkway. The contractor would stockpile the anchor blocks off of US 421 and transport the blocks to be used that day to the construction site. When delivered to the site, the blocks would be placed along one lane of the Parkway ready for installation.

Construction would occur over a period of seven months between November 1 and June 1. The Parkway at the project site would be closed, with a detour, during the winter months (November 1 thru April 15), consequently expediting the work. From April 15 until project completion (less than 2 months), construction would require a single lane closure of the Parkway. Complete Parkway closure would be required daily for ½ -1 hour to transport anchor blocks from storage to the slope location where they would be installed. Single lane closure would be controlled with flagmen, lights, and signs.

It is estimated that a total of 0.78 acres would be disturbed, of which 0.68 acres is forested. Although the anchor blocks would be buried, they would probably impact future tree growth. Therefore, of the total disturbed area, 0.32 acres would be permanently impacted where trees could not grow again directly over set in place anchor blocks. Native tree sprigs would be planted over the covered anchor blocks, between the rows, to revegetate the forested area.

Most waste material to be excavated would be clean fill dirt and rock. Some of this material could be used to construct an access road to the site where anchor blocks would be placed. Other excavated material could be used to cover anchor blocks. It is anticipated that there would be minimal to no excavated waste that would need to be exported. Approximately 100 yards of topsoil material from an offsite borrow pit may need to be imported, but some topsoil could likely be reserved for use from forest clearing.

ALTERNATIVE C – BRIDGE WITH PAVED SHOULDERS

Under Alternative C a bridge with paved shoulders would be constructed to span the unstable slide area. Installation of the bridge requires some slope excavation that would unload some of the unstable fill material when placing the bridge and obliterating the existing roadway. The 2008 cost estimate for this alternative is $4.4M. The cost for this option includes bridge construction, roadway approach work, and slope excavation below the bridge. The bridge would be built on long piles due to deep bedrock and there would be a traditional concrete deck.

The bridge would be placed in the same alignment and footprint as the existing road. Just as other bridges on the Parkway, this bridge would be constructed completely within the straight section of the road alignment between curves to the north and south. The proposed length of the bridge would not exceed 200 feet. Pavement reconstruction would involve removal and reconstruction of approximately 75 linear feet of Hot Asphalt Concrete Pavement (or the entire depth including all courses of existing asphalt pavement) and Compacted Aggregate Base (or the crushed stone material and gravel that are placed beneath the asphalt surfacing) to both the north and south approaches of the bridge for a total of 150 feet. Additionally, there would be milling and overlaying of approximately another 200 linear feet of area outside the slide scarp.

Based on the available subsurface information from recent geotechnical survey tests (FHWA, 2005) and the variability of the depth to the top of rock, a deep foundation consisting of drilled shafts would be required for the support of a bridge at this location. The embedment depth of the shafts would vary considerably parallel and perpendicular to the roadway centerline. Based on seismic results, the average shaft length would exceed 60-ft to meet the load requirements. The excavation depth measured from the existing ground along the Parkway centerline to the grade beneath the proposed structure would be approximately 20 feet for a length of approximately 100 feet centered in the middle of the 200 foot bridge span.

The bridge would be a single-span structure containing abutments with pile foundations (Figure 5). The abutments would be designed to withstand lateral loads since they would be located 5 feet outside of the slide area. The abutments would be designed to reach bedrock, which is on average 60 feet below finish grade of the Parkway in the locations where they would be installed. Additional geotechnical analysis would be required for final cast in place abutment and pile foundation at the bridge abutments design. The concrete or steel girders would have an open design with no boxed in area beneath for road or stream clearance; ground clearance would be 10-14 feet maximum. The bridge would also have class B masonry granite parapet walls.

Subsurface drain piping has been installed in the past that remains in place today, with the intent to drain off some of this subsurface water from beneath the Parkway. There is no reason the existing drainage system would not continue to work with the bridge. The current under-drainage PVC pipes vary in diameter, with most being 1" to 2", and are placed over bedrock and beneath the fill soil layer where it is believed most of the subterranean water flow is. This system of piping intercepts gravel column drains

and are placed at each one of the horizontal drain installations. They are meant to collect the water from the plane of flow and direct it to the toe of the slope.

This bridge alternative would likely have little affect on this system and is less dependent on its existence than the anchor block alternative since spanning the slide area negates the need for the function it provides. If additional subsurface drainage piping is to be included it would be of a design similar to the existing system. There would only be piping installed to collect and direct subsurface drainage at the fill slope slip plane (between fill and competent rock) as does the existing piping system.

Figure 5. Alternative C: example of a bridge similar to proposed bridge.

The proposed bridge would be a single span bridge between supporting abutment piers placed at either end. In contrast to the above photograph, the proposed structure would be single-span with no mid-span supports. It would have steel support girders rather than precast concrete girders as is shown here, cast in place concrete abutments, and similar ground clearance. The class B masonry granite parapet wall construction is similar to the proposed bridge. The parapet walls form the shoulder and guardwall protection all the way across the bridge span.

The bridge would be open allowing sheet flow to continue to flow naturally under the bridge. Any concentrated flows would need to be collected and transported down the slope through swales or pipes. There would be drainage scuppers or ports placed beneath the parapet wall so that sheet drainage on the bridge deck can drain through. Pipes would be installed beneath the roadway approaches to the bridge. Surface drainage could flow naturally beneath the bridge or through culverts.

Construction would require complete closure of the road at the project site for one year, and possibly two. A Parkway detour would be in place for that time period. The contractor would be able to stage construction materials from the adjacent Lewis Fork Parking Overlook (OL). The overlook pavement and stone curb, along with the Parkway pavement between the overlook and the slide, would be reconstructed as part of this project due to likely damage during construction.

It is estimated that a total of 0.33 acres of unpaved area would be disturbed. Little to no forest area would be disturbed, though a few trees (.05 acres) may be removed on the cut slope side of the Parkway to create ground clearance for the bridge. Approximately 250 yards of excavated soil and rock material would be exported and disposed of off site. Approximately 30 yards of topsoil beyond the material that can be salvaged from the site would be imported from an outside source, mixed with grass seed, and placed along the road shoulder approaches on either side of the bridge. Any grassed or forested area cleared of vegetation would be seeded to fescue grasses as per the Parkway standard.

This bridge in this alternative would not stop the continuing movement of the slide; it only isolates the roadway from the slide. There would be minor benefits of relieving mass by excavation and removal of embankment necessary to construct the bridge. The pile foundation of the abutment would support the structure on underlying bedrock and relieve the loads borne by the slope. The major benefit of the bridge is to span and minimally stabilize the slope.

ALTERNATIVE D – BRIDGE WITH GRASS SHOULDERS

Under Alternative D a bridge would be constructed to span the unstable slide area similar to the bridge described in Alternative C but with grassy shoulders. The 2008 cost estimate for this alternative is $5.0M. The cost for this option includes bridge construction, roadway approach work, and slope excavation below the bridge. The bridge would be built on long piles due to the deep bedrock. The cost also includes a bridge deck that continues the grassy shoulder and asphalt roadway across the bridge. This requires an additional steel beam to support the additional weight.

The bridge would be constructed with grassed shoulders (Figure 6), class B masonry guardwalls, and concrete abutments that could support lateral slope movement and would be supported for 200 feet by steel girders. Timing of construction, road closures, area of disturbance and all other aspects other than bridge shoulders would be the same as the description in Alternative C.

ALTERNATIVES CONSIDERED BUT DISMISSED

CEQ regulations for implementing NEPA require that Federal agencies explore and objectively evaluate all reasonable alternatives, and briefly discuss the rationale for eliminating any alternatives that were not considered in detail. This section describes four alternatives that were considered and eliminated from further study. The rationale for elimination is given below.

Road Realignment

This concept would realign the roadway outside of the failure scarp, removing some of the material from the slide by obliterating the existing road. Realignment would move the road into the ridge to the north and a soldier pile wall socketed into rock would be installed. Excavation of slopes would be required for realigning the road. This realignment would be feasible only if steep rock cuts could be achieved with realignment of the Parkway into the ridge. In addition, the realignment alternative would further only be feasible if the depth to rock under the fill embankment was reasonable, which would require a limited length for the soldier piles.

Geotechnical survey test results (FHWA, 2005) indicate that competent rock is located at an approximate depth of 56-ft to 76-ft below the ground surface at the locations of the cut slopes that would result from realigning the Parkway into the ridge to the north. The preferred steep rock cuts would not be realized at these cut slope locations. Realignment of the road towards the uphill side of the Parkway would require extensive stabilization along the downhill side consisting of retaining walls with an anchoring structure because of the depth to competent rock. A soldier pile wall at this location would require a ground anchoring system in addition to extending 5 feet, as a minimum, into competent rock. Based on the subsurface boring and geophysical testing results at the slide location, a cantilevered soldier pile wall would not have the capacity to withstand the lateral forces without an anchoring system.

This alternative was dismissed due to the geotechnical test results that indicate such a proposal is not practical, as well as cost ($6.4 M in 2008 dollars).

Figure 6. Alternative D: example of a bridge similar to proposed bridge. The proposed bridge would look most like this bridge along the roadway with class B masonry parapet walls and guardwall approaches. The bridge in the photo has grassed shoulders over the bridge span and along the guardwall approaches. The proposed bridge would have class B masonry parapet and guardwall approaches with grassy shoulders that would be continuous.

Embankment Excavation

This concept would excavate the embankment to near bedrock level, and reconstruct with benches and gravel drainage layers. This approach alleviates the buildup of pore pressures in the embankment and improves soil conditions along the existing slip surface. This proposal may extend beyond the NPS right-of-way boundaries. It was dismissed after completing the Value Analysis and because the treatment of slope grading would appear very unnatural requiring massive vegetation removal and the appearance of angular sculpted slopes never before used to such as extent on the Parkway.

Rock Buttresses

This concept would construct rock buttresses near the toe of the slide to provide stability. This alternative was dismissed after completing the Value Analysis and as rock buttresses would require significant excavation and tree clearing for installation. Additionally, their limits may extend beyond the present NPS right-of-way. This option might be considered a new design element in the cultural landscape if implemented on the cut slope of the Parkway, although such structures have been used on the fill slopes of the Parkway in other locations.

Retaining Walls

This concept would construct retaining walls either near the roadway or part way down the slope to provide stability. Retaining walls would need to be massive due to the anticipated depth to rock (30 to 60-feet) and would need to be constructed along several levels. It is likely that micropyles or soil nail walls drilled and grouted into bedrock, or some other anchorage system, would be necessary to provide lateral resistance for the wall. This option was dismissed after completing the Value Analysis and because slope clearing would be massive on both cut and fill slopes. The use of retaining walls on the cut slope side of the Parkway is an option not used on the Parkway in any other location to date. Geotechnical studies and calculations would determine the final feasibility of this option.

ENVIRONMENTALLY PREFERRED ALTERNATIVE

In accordance with DO-12, the NPS is required to identify the "environmentally preferred alternative" in all environmental documents, including EAs. The environmentally preferred alternative is determined by applying the criteria suggested in NEPA, which is guided by the CEQ. As stated in Section 2.7 (D) of the NPS DO-12 Handbook, "The environmentally preferred alternative is the alternative that will best promote the national environmental policy expressed in NEPA (Section 101(b))." This environmental policy is stated in six goal statements, which include:

1. Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
2. Assure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings;
3. Attain the widest range of beneficial uses of the environment without degradation, risk to health and safety, or other undesirable and unintended consequences;
4. Preserve important historic, cultural, and natural aspects of our national heritage, and maintain wherever possible, an environment which supports diversity and variety of individual choice;
5. Achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities; and
6. Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources (NEPA, 42 USC 4321-4347).

In sum, the environmentally-preferred alternative is the alternative that, not only results in the least damage to the biological and physical environment, but also that best protects, preserves, and enhances historic, cultural, and natural resources.

As evaluated against the CEQ regulations, Alternative B is the Environmentally Preferred Alternative. The No Action Alternative represents the current situation of an unstable roadbed, has high potential for catastrophic failure, and is a traffic safety problem due to uneven pavement caused by continued settlement. This alternative would not uphold the NPS mandate to administer and protect the Park for the enjoyment of natural, cultural, and scientific resources in a manner that leaves these resources unimpaired, while maintaining the Parkway as a safe road.

The Environmentally Preferred Alternative is Alternative B because it surpasses the No Action Alternative and the other action alternatives in realizing the full range of national environmental policy goals as stated in §101 of NEPA. Alternative B would stabilize the moving slope with an anchor block system and effectively eliminate the public safety issues associated with the area. The estimated area of disturbance would be greater under Alternative B than Alternatives C and D (0.78 vs. 0.33 acres); however, a difference of less than half an acre would not be considered biologically significant for this area. Additionally, slide movement after implementation of Alternative B is very low, thus no additional natural resources would be impacted, while slide movement would still be possible after implementation of Alternatives C and D, thus disturbing additional forested areas. More potentially significant is the possible disturbance of the cerulean warbler during two breeding seasons under Alternatives C and D, compared to possibly only one breeding season under Alternative B. Alternative B would also have the least visual impact on the cultural landscape as the road would not be altered and the forest would eventually return to similar current conditions. Finally, risk factors under Alternative B (very low for both slope and Parkway) would be more favorable than under the No Action (high for both slope and Parkway) and Alternatives C and D (low for slope, and very low for Parkway).

In conclusion, Alternative B provides the highest level of protection of natural and cultural resources while supporting the transportation requirements of the Parkway.

MITIGATION MEASURES

For all action alternatives, best management practices and mitigation measures would be used to prevent or minimize potential adverse effects associated with road repairs at MP 270.3. These practices and measures would be incorporated to reduce the magnitude of impacts and ensure that major adverse impacts would not occur. Mitigation measures undertaken during project implementation would include, but would not be limited to, those listed below. The impact analysis in the "Environmental Consequences" section was performed assuming that these best management practices and mitigation measures would be implemented as part of all action alternatives.

Soils, Vegetation, and Wildlife

- Limiting the area of disturbance. For example, heavy construction equipment would be kept on the road surface to the extent possible (i.e., when performing excavation adjacent to the roadway).

- Construction areas would be identified by and fenced with construction tape, snow fencing, or some similar material prior to any construction activity. The fencing would define the construction zone and confine activity to the minimum area required for construction. All protection measures would be clearly stated in the construction specifications, and workers would be instructed to avoid

construction activities beyond the construction zone, as delineated by the construction zone fencing. Construction materials would be stored in previously disturbed areas.

- Best management practices would be implemented during construction to prevent soil erosion due to wind and rain. The erosion prevention practices would include using silt screening around any disturbed areas, mulching all exposed slopes, placing staked hay bales in drainages, and sprinkling exposed soil to prevent wind erosion. Upon completion of the construction project, all disturbed soils would be revegetated to prevent erosion.

- If erosion matting/netting is required, a biodegradable type with mesh that is small enough (1/2" or less) to not entangle snakes and other animals shall be used.

- Removing and stockpiling topsoil for reapplication to disturbed areas when construction is complete.

- Restoring disturbed areas to natural contours to the extent possible to reduce the potential for erosion and revegetating with native species from genetic stocks originating in the Park, or from plants previously removed from the construction area whenever possible. Revegetation efforts would be designed to reconstruct the natural spacing, abundance, and diversity of native plant species.

- Subsequent to project completion, Park staff would monitor and require removal of any invasive species observed.

- Mitigation for the minor loss of habitat would include the use of native plants in revegetation and removing the nuisance exotic vegetation in the remaining habitat.

- Obtaining gravel and fill for construction or maintenance from certified noxious weed-free sources. Gravel pits and fill sources would be inspected to identify weed-free sources. There would be no quarrying of construction materials from inside the park.

- To the extent possible, construction activities would be timed to avoid sensitive wildlife periods, such as breeding season.

- Construction vehicles could leak fluids into the soil, introduce noise pollution, and emit pollutants to the atmosphere. To minimize this possibility, equipment would be checked frequently to identify and repair any leaks, mufflers would be checked for proper operation, and only equipment that is within proper operating specifications would be used.

- Providing fuel and oil services for construction machinery in a designated area away from channels or drainages. This would include secondary containment for all fuel storage tanks and on-site availability of a specialized “spill kit” with capacity to contain a 95 gallon fuel spill.

- Construction activities could introduce dust to the atmosphere. To minimize this possibility, best management practices for dust control, such as covering piles of excavated material with fabric and using water to limit dust during excavation activities, would be used.

- All debris would be removed from the park for legal and proper disposal.

Visitor Use and Experience and Human Health and Safety

- Providing signs to warn travelers about road construction and traffic delays; the use of alternative routes and destinations may be encouraged.

- Using well-tuned construction equipment with properly operating mufflers and performing work during low visitation periods.

- During construction activities, traffic flows and safety would be maintained by keeping construction equipment as far off the road as possible and by providing flag bearers to assist traffic negotiating through construction areas.

- Minimizing adverse impacts to visitor use and experience of the natural landscape. These measures could include the use of rock facing on bridge abutments, and the use of coloring on constructed elements to blend their appearance with the surrounding landscape.

- Monitoring the slide area for movement during construction and reacting to any unexpected movements.

Cultural Resources

Mitigation measures for the cultural landscape would include minimal disruption and disturbance of local vegetation, dust abatement, and re-planting and re-landscaping any areas affected by construction activities.

If previously unknown archeological resources are discovered during construction, all work in the immediate vicinity (600 feet) of the discovery shall be halted until the resources are identified and documented and an appropriate mitigation strategy developed, if necessary, in accordance with pertinent laws and regulations, including the stipulations of the 1995 Programmatic Agreement Among the National Park Service (U.S. Department of the Interior), the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers.

COMPARISON OF ALTERNATIVES

Table 1 compares actions and attributes associated with the alternatives.

Table 1. Summary Comparison of Alternatives

	Alternative A *No Action*	**Alternative B** *Anchor Blocks (Preferred Alternative)*	**Alternative C** *Bridge with paved shoulders*	**Alternative D** *Bridge with grass shoulders*
Total Cost	*	$2.7M	$4.4M	$5.0M
Area of Disturbance	N/A	0.78	0.33	0.33
# of lanes closed	none	1	all	all
Tourist seasons	none	1	2	2
Slide addressed	no	yes	partly	partly
Road affected by continued movement	yes	yes	no	no
Visual impact	no	Tree loss	Bridge appearance	Bridge appearance
Revegetation	none	Tree sprigs and grass seed	Grass seed	Grass seed
Risk factors	High slope / high Parkway	very low slope / very low Parkway	low slope / very low Parkway	low slope / very low Parkway

*The no-action alternative is likely to have the highest cost level since it would require continued cyclic maintenance at considerable cost that would only increase with time.

Table 2 compares the potential environmental impacts resulting from the alternatives. Potential impacts are provided according to environmental resource topic. The *Environmental Consequences* section of this EA contains a detailed discussion of these potential impacts by resource topic.

Table 2. Summary Comparison of Impacts

Impact Topic	Alternative A: No Action	Alterative B: Anchor Blocks (Preferred Alt.)	Alternative C: Bridge w/ Paved Shoulders	Alternative D: Bridge w/Grass Shoulders
Soils and Geology	Negligible, long-term, localized, direct adverse impacts to soils and geology from continued erosion and continued cyclic maintenance. *Negligible adverse cumulative impacts on soils and geology.*	Minor, short-term, localized, direct adverse impacts to soils from compaction, erosion, and removal during construction activities, and negligible, long-term, localized direct adverse impacts on geology from drilling of bedrock. *Negligible adverse cumulative impacts on soils and geology.*	Minor, short-term, localized, direct adverse impacts to soils from compaction, erosion, and removal during construction activities. Negligible, long-term, localized direct adverse impacts on geology from drilling of bedrock. *Negligible adverse cumulative impacts on soils and geology.*	Minor, short-term, localized, direct adverse impacts to soils from compaction, erosion, and removal during construction activities. Negligible, long-term, localized direct adverse impacts on geology from drilling of bedrock. *Negligible adverse cumulative impacts on soils and geology.*
Water Resources	Negligible, long-term, localized, direct adverse impacts to water resources from continued erosion and sedimentation due to slide movement. *Negligible adverse cumulative impacts on water resources.*	Minor, short-term, localized, direct adverse impacts on water resources from possible sedimentation and contamination during construction activities. *Negligible adverse cumulative impacts on water resources.*	Minor, short-term, localized, direct adverse impacts on water resources from possible sedimentation and contamination during construction activities. *Negligible adverse cumulative impacts on water resources.*	Minor, short-term, localized, direct adverse impacts on water resources from possible sedimentation and contamination during construction activities. *Negligible adverse cumulative impacts on water resources.*
Vegetation	Negligible, short-term, localized, direct adverse impacts to the vegetation due to continued cyclic maintenance of the road.	Minor, short-term, localized, direct adverse impacts on vegetation from trampling and clearing during construction activities.	Minor, short-term, localized, direct adverse impacts on vegetation from trampling and clearing during construction activities.	Minor, short-term, localized, direct adverse impacts on vegetation from trampling and clearing during construction activities.

Impact Topic	Alternative A: No Action	Alterative B: Anchor Blocks (Preferred Alt.)	Alternative C: Bridge w/ Paved Shoulders	Alternative D: Bridge w/Grass Shoulders
	Negligible adverse cumulative impacts on vegetation.	*Negligible adverse cumulative impacts on vegetation.*	*Negligible adverse cumulative impacts on vegetation.*	*Negligible adverse cumulative impacts on vegetation.*
Wildlife	Negligible, short-term, localized, direct adverse impacts on wildlife and habitat from disturbance during continued cyclic maintenance. *Negligible adverse cumulative impacts to wildlife.*	Minor, short-term, localized, direct adverse impacts on wildlife and habitat from disturbance during construction activities. *Minor adverse cumulative impacts to wildlife.*	Minor to moderate, short-term, localized, direct adverse impacts on wildlife and habitat from disturbance during construction activities, with possible impacts on cerulean warblers for more than one breeding season. *Minor adverse cumulative impacts to wildlife.*	Minor to moderate, short-term, localized, direct adverse impacts on wildlife and habitat from disturbance during construction activities, with possible impacts on cerulean warblers for more than one breeding season. *Minor adverse cumulative impacts to wildlife.*
Visitor Use and Experience	Negligible, short-term, direct, adverse impacts on visitor use and experience due to inconvenience during continuing cyclic maintenance of deteriorating road conditions. *Negligible adverse cumulative impacts on visitor use and experience.*	Minor, short-term, direct adverse impacts on visitor use and experience from noise, changes in visual resources, and inconvenience during construction. *Minor adverse cumulative impacts on visitor use and experience.*	Moderate, short-term, direct adverse impacts on visitor use and experience from road closure during construction for up to two peak tourist seasons and negligible, long-term, direct adverse impacts due to visual changes in road configuration. *Minor adverse cumulative impacts on visitor use and experience.*	Moderate, short-term, direct adverse impacts on visitor use and experience from road closure during construction for up to two peak tourist seasons and negligible, long-term, direct adverse impacts due to visual changes in road configuration. *Minor adverse cumulative impacts on visitor use and experience.*

Impact Topic	Alternative A: No Action	Alterative B: Anchor Blocks (Preferred Alt.)	Alternative C: Bridge w/ Paved Shoulders	Alternative D: Bridge w/Grass Shoulders
Cultural Landscapes	No impacts on the cultural landscape. *No cumulative impacts on cultural landscapes.*	Negligible, short-term, localized, direct adverse effects on the cultural landscape from vegetation removal and construction grading. *Negligible adverse cumulative impacts on cultural landscapes.*	Negligible, short-term, localized, direct adverse effects on the cultural landscape from vegetation removal and construction grading and minor, long-term, localized, direct adverse effects from changing a section of road into a bridge. *Negligible adverse cumulative impacts on cultural landscapes.*	Negligible, short-term, localized, direct adverse effects on the cultural landscape from vegetation removal and construction grading and minor, long-term, localized, direct adverse effects from changing a section of road into a bridge. *Negligible adverse cumulative impacts on cultural landscapes.*
Human Health and Safety	Moderate, long-term, adverse, direct impacts on human health and safety as road hazards would continue to exist *Moderate adverse cumulative impacts on human health and safety.*	Moderate, long-term, beneficial, direct impacts on human health and safety due to the stabilization of the moving slope and roadway. *Minor beneficial cumulative impacts to human health and safety.*	Minor to moderate, long-term, beneficial, direct impacts on human health and safety due to the stabilization of the roadway. *Minor beneficial cumulative impacts to human health and safety.*	Minor to moderate, long-term, beneficial, direct impacts on human health and safety due to the stabilization of the roadway. *Minor beneficial cumulative impacts to human health and safety.*

ENVIRONMENTAL CONSEQUENCES

This section describes the affected environment and environmental consequences associated with the alternatives. It is organized by impact topic, which distills the issues and concerns into distinct topics for discussion analysis. These topics focus on the presentation of the affected environment and environmental consequences and allow a standardized comparison between alternatives based on the most relevant topics.

METHODOLOGY

NEPA requires consideration of context, intensity, and duration of impacts, direct or indirect impacts, cumulative impacts, and measures to mitigate for impacts. NPS policy also requires that "impairment" of resources be evaluated in all environmental documents.

Overall, the NPS based the following impact analyses and conclusions on the review of existing literature and Blue Ridge Parkway studies, information provided by experts within the NPS and other agencies, professional judgments and park staff insights, and public input.

General Impact Definitions

Potential impacts are described in terms of type (beneficial or adverse), context, duration, intensity, and impairment. The following general definitions were used to evaluate the context, intensity, duration, and cumulative nature of impacts associated with project alternatives. Impairment is discussed below. The specific criteria used to rate the intensity and duration of potential impacts for each resource topic are presented within each resource area impact analysis in this chapter.

Context of Impact

Context is the setting within which an impact is analyzed, such as local, park-wide, or regional. CEQ requires that impact analysis include discussions of context. Localized impacts are those that affect the resource area only on the project site or its immediate surroundings, and would not extend park-wide or into the region.

Intensity of Impact

Impact intensity is the degree to which a resource would be beneficially or adversely affected by an action. Impact intensities are quantified as negligible, minor, moderate, or major. Resource-specific criteria used to rate the intensity of project impacts are presented within each resource area impact analysis.

Duration of Impact

The duration of impact is analyzed independently for each resource because impact duration is dependent on the resource being analyzed. Depending on the resource, impacts may last as long as construction takes place, or a single year or growing season, or longer. For purposes of analysis, impact duration is measured in short-term and long-term. Resource-specific criteria used to rate the anticipated duration of resource impacts are presented within each resource area impact analysis.

Direct verses Indirect Impacts

Direct effects are impacts caused by the alternative(s) at the same time and in the same location as the action. Indirect effects are impacts caused by the alternative(s) that occur later in time or farther in distance than the action, but still reasonably foreseeable. An indirect impact could occur because of a change to another resource or impact topic.

Cumulative Impact Scenario

CEQ regulations (40 CFR 1508.7) require the assessment of cumulative impacts in the decision-making process for Federal projects. A cumulative impact is an impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of which agency (Federal or non-Federal), organization, or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time.

Cumulative impacts are considered for all alternatives and are presented at the end of each impact topic discussion analysis. To determine potential cumulative impacts, projects in the vicinity of the proposed project site were identified. Potential projects identified as cumulative actions included any planning or development activity that was currently being implemented or that would be implemented in the reasonably foreseeable future.

These cumulative actions are evaluated in the cumulative impact analysis in conjunction with the impacts of each alternative to determine if they would have any additive effects on natural resources, cultural resources, or visitor use. Because some of these cumulative actions are in the early planning stages, the evaluation of cumulative effects was based on a general description of the project. Known past, current, and reasonably foreseeable future projects and actions in the vicinity of the project area are described below.

Repair/Resurface Deteriorated Road Section 2D, MP 248-261
This project consists of milling and resurfacing and rehabilitating approximately 13.3 miles of the Blue Ridge Parkway, Section 2D, from Milepost 247.9 (ramp on State Route 18) to MP 261.2 (at SR 16). Milling and resurfacing, and rehabilitating appurtenant overlooks, parking areas, developed areas, spurs and access roads are also included. There are three parking and overlooks along this section. The project includes pavement removal, milling, pavement patching, asphalt paving, shoulder stabilization, stone curb removal and replacement, concrete curb removal, drainage work, guardrail replacement and miscellaneous work. Drainage work consists of inspecting and evaluating culverts, inlets and ditches for the need for reconditioning or replacement. Safety design and recommendations for safety improvements will be considered as necessary. Replacement of existing or providing new provisions for handicapped accessibility according to current ADA guidelines will also be required. This is a FY 2009-2010 project and could overlap the project at MP 270.3 but would not likely require a detour.

Repair/Resurface Road Section 2H&J, MP 299.4-317.5 (2H13,J16)
The project limits extend between MP 299.0 at Cold Prong Pond Overlook and MP 317.5 at US 221 at the end of Section 2J and beginning of Section 2K. This project would provide pavement patching in areas of subgrade distress or where pavement is severely deteriorated; mill and overlay or overlay entire Parkway within project limits; clean and overlay all asphalt ditches not requiring reconstruction; repoint and/or reset stone in rubble ditches requiring rehabilitation; and regrade all shoulders with aggregate-topsoil to within ½ inch of edge of pavement final grade. The Parkway would be analyzed for safety improvements, including locations requiring placement of guardrail, signs, provide breakaway sign

supports as required and replacement of old or damaged sign panels not meeting current MUTCD standards for size, legend, color or retro-reflectivity. Pavement markings would be restriped, evaluated and corrected for sight distance and passing zone. Concrete bridge decks would have all cracks sealed. There are no road closures anticipated for this project. This is a FY 2010-2011 project that should not overlap the MP 270.3 project time schedule.

Repair Goshen Creek Bridge, MP 286.3 (2F22)
This project consists of rehabilitation of the Goshen Creek Bridge. This bridge is located in North Carolina approximately 5 miles north of the intersection with US 321 at Milepost 286.29 and carries the Parkway over North Carolina State Route (SR) 1514 and Goshen Creek. The project proposed to replace he deck and possibly the bridge railings with rehabilitation to the other elements of the bridge. The general work items of this project include: repairing various cracking in the concrete bridge supports, abutments, and wing walls; cleaning and re-pointing the stone masonry joints; cleaning and repairing the stone approach walls north and south of the bridge; removing the existing bridge overlay and installing a new wearing course; rehabilitating the asphalt pavement at the bridge approaches; and other miscellaneous repairs and improvements. This is a 2007 project that would likely require road closure 16 miles to the south of the MP 270.3 project with a possible schedule overlap. U.S. Highway 321/221 in Boone NC, to U.S. Highway 421 in Deep Gap would be a likely detour around the bridge. If the MP 270.3 project requires a detour then the above detour could be extended along U.S. Highway 221 at Deep Gap to S.R. 163 where it would reconnect with the Parkway at MP 261 near Jumping Off Rocks OL. Another potential detour route would be U.S. Highway 421 at Deep Gap to S.R. 16 also connecting to the Parkway at MP 261.

Developed Area Management Plan for the Cone Estate at MP 294
The Moses H. Cone Memorial Park is located on the north side of the town of Blowing Rock in Watauga County, North Carolina, and lies between mileposts 292 and 295 on the Blue Ridge Parkway. It is a designed historic landscape 3,516 acres in extent, administered by the Blue Ridge Parkway, including 20 room manor house with three constructed lakes, hundreds of acres of apple orchards, pastures, a deer park and an extensive carriage road system. A Memorial Park Developed Area Management Plan and Environmental Assessment to address current resource and visitor use issues is currently being prepared. Project planning objectives include 1) developing natural and cultural resource management strategies; 2) defining the diverse range of resource-based visitor experience opportunities; 3) analyzing potential visitor services (carriage rides, horseback riding, art and craft sales, interpretive exhibits, personnel services, etc.) to identify potential visitor demands and needs; and 4) determining compatible uses, identifying appropriate locations for new facilities, and defining interpretation programs and services to be provided.

Impairment of Park Resources

In addition to determining the environmental consequences of the Proposed Action and other alternatives, the NPS *Management Policies 2001* and DO-12 require analysis of potential effects to determine if actions would impair a park's resources.

The fundamental purpose of the National Park System, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. NPS managers must always seek ways to avoid or minimize to the greatest degree practicable adverse impacts on park resources and values. However, the laws do give NPS management discretion to allow impacts 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. Although Congress has given NPS management discretion to allow certain impacts within parks, that discretion is

limited by statutory requirement that the NPS must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including opportunities that otherwise would be present for the enjoyment of those resources or values. An impact to any park resource or value may constitute an impairment. However, an impact would more likely constitute an impairment to the extent it affects 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 Master Plan or General Management Plan (GMP) or other relevant NPS planning documents.

Impairment may result from NPS activities in managing the park, visitor activities, or activities undertaken by concessionaires, contractors, and others operating in the park. In this section, a determination on impairment is made in the conclusion statement of each resource area for each alternative. The NPS does not analyze the potential for impairment of recreational values/visitor experience (unless impacts are resource based), socioeconomic values, or park operations.

SOILS AND GEOLOGY

Affected Environment

Based on review of plans and previous investigations, the landslide at MP 270.3 is through a large hillside fill. The fill is in a natural landslide area with colluviums (landslide debris) deposits overlying residual soils and ultimately bedrock. The colluviums consist of boulders with sand and silt, and the residual soils consist of micaceous silty sands and sandy silts formed by in-place weathering of the parent mica gneiss and schist bedrock. Geophysical survey test results performed along the proposed fill wall alignment and cut walls alignment indicates that depth to competent rock varies between 56-ft and 76-ft (FHWA, 2005). It has not yet been determined how far down slope from the Parkway the toe of movement or drainage release actually is.

Wilkes County soils in the vicinity of the project site are characterized as the Evard-Cowee-Chestnut complex. To the south side of the Parkway (downhill), the soils series that may occur are Chestnut, Edneyville, and Ashe. To the north side of the Parkway (uphill), the Cowee and Saluda series may occur (NRCS, no date).

The Chestnut series consists of moderately deep, well drained soils on gently sloping to very steep ridges and side slopes of the Blue Ridge. This gravelly loam soil formed in residuum that is affected by soil creep in the upper part, and weathered from felsic or mafic igneous or high-grade metamorphic rocks such as granite, hornblende gneiss, granodiorite, biotite gneiss, and high-grade metagraywacke. It has moderately rapid permeability. Runoff class is low on gentle slopes, medium on strong or moderately steep slopes, and high on steeper slopes. Runoff is much lower where forest cover is intact. Most of the soil is in forest.

The Edneyville series consists of very deep, well drained soils on gently sloping to very steep ridges and side slopes of the Blue Ridge. This fine sandy loam was formed as was the Chestnut series soil. It also has moderately rapid permeability. Runoff class is very low on gentle slopes, low on strong or moderately steep slopes, and medium on steeper slopes. Runoff is much lower where forest cover is intact.

The Ashe series consists of moderately deep, somewhat excessively drained soils on gently sloping to very steep ridges and side slopes of the Blue Ridge. This sandy loam was formed as was the Chestnut series soil. It also has moderately rapid permeability. Runoff is similar to the Chestnut series and is much lower where forest litter has little or no disturbance.

The Cowee series consists of moderately deep, well drained, moderately permeable soils on ridges and side slopes of the Blue Ridge. This gravelly sandy loam formed in residuum affected by soil creep in the upper part, and weathered from felsic to mafic, igneous and high-grade metamorphic rocks. Runoff class is low on gentle slopes, medium on strong or moderately steep slopes, and high on steeper slopes. Runoff is much lower where forest litter has little or no disturbance.

The Saluda series consists of shallow, well drained, moderately permeable soils that formed in weathered granite, gneiss, or schist. This sandy loam allows for rapid surface runoff. Most areas are forested.

Methodology

Information on soils was based on recent geophysical testing conducted within the project area, NRCS soils surveys, and on previous projects conducted within the same area. The impact analysis examines the potential changes to soils that may occur as a result of project implementation.

The thresholds of change for the intensity of an impact on soils are defined as follows:

Negligible: Soils would not be affected or the effects on soils would be below or at the lower levels of detection. Any effects to soils would be slight and would return to normal shortly after completion of project activities.

Minor: The effects on soils would be detectable, but effects on soil productivity, fertility, or area would be small. Mitigation may be needed to offset adverse effects and would be relatively simple to implement and likely be successful.

Moderate: The effect on soil would be readily apparent and result in a change to the soil character over a relatively wide area. Mitigation measures would be necessary to offset adverse effects and likely be successful.

Major: The effect on soil would be readily apparent and substantially change the character of the soils over a large area in and out of the Park. Mitigation measures to offset adverse effects would be needed, extensive, and their success could not be guaranteed.

The thresholds of change for the duration of an impact on soils are defined as follows:

Short-term: Recovers in less than three years.
Long-term: Takes more than three years to recover.

Impacts of the No Action Alternative

Impacts Analysis
Under Alternative A, there would be no new impacts on soils or geology as there would not be any new actions. There would be no construction and, therefore, no need for earthwork activities, such as filling, grading, or excavation. No new causes for erosion would occur and there would not be any loss of soil fertility. However, the slide would continue to move slowly over the long-term, with possible continuing negative effects on soils, such as erosion. Continued cyclic maintenance of the road at MP 270.3 could cause soil compaction or erosion along the roadside from heavy equipment or foot traffic.

Cumulative Effects
Soils along the Parkway are subject to damage from road maintenance activities, natural processes (such as flooding), and visitor access. Two future projects to repair and resurface nearby road sections and another to repair the nearby Goshen Creek Bridge are planned for 2007 through 2011. These projects would contribute adverse cumulative impacts on soils, such as compaction and erosion. The Developed Area Management Plan for the Cone Estate could identify additional visitor uses and construction of new facilities that would also affect soils. Although no new construction would occur under the No Action Alternative, there would be negligible, adverse cumulative effects on soils and geology as a result of continued cyclic maintenance.

Conclusion
Alternative A would have long-term, negligible, localized, direct adverse impacts to soils and geology from continued erosion and continued cyclic maintenance. Alternative A would contribute negligible, adverse cumulative impacts to soils and geology along the Parkway. Because there would be no major adverse impacts to a resource or value whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park; 2) key to the natural or cultural integrity of the Park or to opportunities for enjoyment of the Park; or 3) identified as a goal in the Park's GMP or other relevant NPS planning documents, there would be no impairment of the Park's resources or values with respect to soils and geology.

Impacts of Alternative B (Anchor Blocks)

Impacts Analysis
Alternative B would entail disturbing soils temporarily during installation of anchor blocks. The site preparation would require grading, excavation, and filling, but this would occur in soil that was previously disturbed consisting of roadbase material placed during the construction of the Parkway. Some previously undisturbed soils may be disturbed toward the bottom of the slide by compaction from heavy equipment, soil removal, or soil erosion. As the majority of disturbance would occur in previously disturbed areas, adverse soil impacts would be minimized.

It is estimated that a total of 0.78 acres would be disturbed, of which 0.68 acres is forested. Although the anchor blocks would be buried, they would probably impact future tree growth. Therefore, of the total disturbed area, 0.32 acres would be permanently impacted where trees could not grow again directly over set in place anchor blocks. The slope wedges with the anchor block would be covered over with fill soils, topsoil, and seeded with grass to prevent erosion. Native trees would be planted over the covered anchor blocks, between the rows, to revegetate the forested area.

Anchor blocks would be stabilized by a heavy cable that would be drilled down and into competent rock, thus impacting the bedrock. Holes drilled into bedrock would be permanent but would be located in the small area of the project site and would be buried.

There would be alteration of soil function from construction activities. If any natural soil horizons exist, they would likely be lost during the earthwork. Construction would compact and destroy the structure and function of the organic soil horizon and mineral soils, potentially resulting in increased runoff and erosion. Best management practices would be implemented during construction to prevent or minimize soil erosion due to wind and rain.

As the anchor blocks would be stored and staged outside of the Parkway, there would not be any additional soil impacts from this activity.

Cumulative Effects
Soils along the Parkway are subject to damage from road maintenance activities, natural processes (such as flooding), and visitor access. Two future projects to repair and resurface nearby road sections and another to repair the nearby Goshen Creek Bridge are planned for FY 2007 through 2011. These projects would contribute adverse cumulative impacts on soils, such as compaction and erosion. The Developed Area Management Plan for the Cone Estate could identify additional visitor uses and construction of new facilities that would also affect soils. Given the significant soil impacts from original construction of the Parkway, along with numerous other past and future road work projects, implementation of Alternative B would contribute negligible, negative cumulative impacts to soils and geology.

Conclusion
Alternative B would likely result in short-term, minor, localized, direct adverse impacts to soils from compaction, erosion, and removal during construction activities. Alternative B would likely result in long-term, negligible, localized direct adverse impacts on geology from drilling of bedrock. Alternative B would contribute negligible, adverse cumulative impacts to soils and geology along the Parkway. Because there would be no major adverse impacts to a resource or value whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park; 2) key to the natural or cultural integrity of the Park or to opportunities for enjoyment of the Park; or 3) identified as a goal in the Park's GMP or other relevant NPS planning documents, there would be no impairment of the Park's resources or values with respect to soils and geology.

Impacts of Alternative C (Bridge with paved shoulders)

Impacts Analysis
Alternative C would entail disturbing soils during bridge construction. The site preparation would require grading, excavation, and filling, but this would occur in soil that was previously disturbed consisting of roadbase material placed during the construction of the Parkway. Some previously undisturbed soils may be disturbed by compaction from heavy equipment, soil removal, or soil erosion. It is estimated that a total of 0.33 acres of unpaved area would be disturbed. Approximately 250 yards of excavated soil and rock material would be exported and disposed of off site. As the bridge would be placed in the same alignment and footprint as the existing road and as the majority of disturbance would occur in previously disturbed areas, adverse soil impacts would be minimized.

A deep foundation consisting of shafts drilled into bedrock would be required for the support of a bridge, with the average shaft length exceeding 60 feet to meet the load requirements. Holes drilled into bedrock would be permanent but would be located in the small area of the project site.

In addition to the complete removal of 250 yards of excavated soils, there would be alteration of soil function from construction activities to remaining soils that are impacted. If any natural soil horizons exist, they would likely be lost during the earthwork. Construction would compact and destroy the

structure and function of the organic soil horizon and mineral soils, potentially resulting in increased runoff and erosion. Best management practices would be implemented during construction to prevent or minimize soil erosion due to wind and rain. All disturbed areas would be reseeded to prevent further erosion. As there would be little to no impact on forested areas, forest revegetation should not be necessary.

Construction materials would be staged at the adjacent Lewis Fork Parking Overlook. Although materials would be staged on paved surfaces, it is possible that a small area of soils adjacent to the paved surfaces would be compacted from foot traffic or heavy equipment.

Cumulative Effects

Soils along the Parkway are subject to damage from road maintenance activities, natural processes (such as flooding), and visitor access. Two future projects to repair and resurface nearby road sections and another to repair the nearby Goshen Creek Bridge are planned for FY 2007 through FY 2011. These projects would contribute adverse cumulative impacts on soils, such as compaction and erosion. The Developed Area Management Plan for the Cone Estate could identify additional visitor uses and construction of new facilities that would also affect soils. Given the significant soil impacts from original construction of the Parkway, along with numerous other road work projects, implementation of Alternative C would contribute negligible, negative cumulative impacts to soils and geology.

Conclusion

Alternative C would likely result in short-term, minor, localized, direct adverse impacts to soils from compaction, erosion, and removal during construction activities; however, soil that is excavated and removed would constitute a permanent impact. Alternative C would likely result in long-term, negligible, localized direct adverse impacts on geology from drilling of bedrock. Alternative C would contribute negligible, adverse cumulative impacts to soils and geology along the Parkway. Because there would be no major adverse impacts to a resource or value whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park; 2) key to the natural or cultural integrity of the Park or to opportunities for enjoyment of the Park; or 3) identified as a goal in the Park's GMP or other relevant NPS planning documents, there would be no impairment of the Park's resources or values with respect to soils and geology.

Impacts of Alternative D (Bridge with grassy shoulders)

Impacts Analysis

Alternative D would entail disturbing soils during bridge construction. The site preparation would require grading, excavation, and filling, but this would occur in soil that was previously disturbed consisting of roadbase material placed during the construction of the Parkway. Some previously undisturbed soils may be disturbed by compaction from heavy equipment, soil removal, or soil erosion. It is estimated that a total of 0.33 acres of unpaved area would be disturbed. Approximately 250 yards of excavated soil and rock material would be exported and disposed of off site. As the bridge would be placed in the same alignment and footprint as the existing road and as the majority of disturbance would occur in previously disturbed areas, adverse soil impacts would be minimized.

Approximately 30 yards of topsoil beyond the material that can be salvaged from the site would be imported from an outside source for the grassy shoulders. A deep foundation consisting of shafts drilled into bedrock would be required for the support of the bridge, with the average shaft length exceeding 60 feet to meet the load requirements. A bridge deck that continues the grassy shoulder and asphalt roadway across the bridge requires an additional steel beam drilled into bedrock to support the additional weight. Holes drilled into bedrock would be permanent but would be located in the small area of the project site.

In addition to the complete removal of 250 yards of excavated soils, there would be alteration of soil function from construction activities to remaining soils that are impacted. If any natural soil horizons exist, they would likely be lost during the earthwork. Construction would compact and destroy the structure and function of the organic soil horizon and mineral soils, potentially resulting in increased runoff and erosion. Best management practices would be implemented during construction to prevent or minimize soil erosion due to wind and rain. All disturbed areas would be reseeded to prevent further erosion. As there would be little to no impact on forested areas, forest revegetation should not be necessary.

Construction materials would be staged at the adjacent Lewis Fork Parking Overlook. Although materials would be staged on paved surfaces, it is possible that a small area of soils adjacent to the paved surfaces would be compacted from foot traffic or heavy equipment.

Cumulative Effects
Soils along the Parkway are subject to damage from road maintenance activities, natural processes (such as flooding), and visitor access. Two future projects to repair and resurface nearby road sections and another to repair the nearby Goshen Creek Bridge are planned for FY 2007 through FY 2011. These projects would contribute adverse cumulative impacts on soils, such as compaction and erosion. The Developed Area Management Plan for the Cone Estate could identify additional visitor uses and construction of new facilities that would also affect soils. Given the significant soil impacts from original construction of the Parkway, along with numerous other road work projects, implementation of Alternative D would contribute negligible, negative cumulative impacts to soils and geology.

Conclusion
Alternative D would likely result in short-term, minor, localized, direct adverse impacts to soils from compaction, erosion, and removal during construction activities; however, soil that is excavated and removed would constitute a permanent impact. Alternative D would likely result in long-term, negligible, localized direct adverse impacts on geology from drilling of bedrock. Alternative D would contribute negligible, adverse cumulative impacts to soils and geology along the Parkway. Because there would be no major adverse impacts to a resource or value whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park; 2) key to the natural or cultural integrity of the Park or to opportunities for enjoyment of the Park; or 3) identified as a goal in the Park's GMP or other relevant NPS planning documents, there would be no impairment of the Park's resources or values with respect to soils and geology.

WATER RESOURCES, INCLUDING WETLANDS

Affected Environment

Designed as a scenic drive, the Blue Ridge Parkway motor road tends to run along the ridge tops looking down on neighboring lands. Unlike downstream areas that receive pollution and discharges from activities at upstream sites, the Parkway owns the sources of many of its streams and they are generally clean and free of common pollutants. Being up on top also means that the Parkway has many headwater streams, such as the small perennial stream located about 20 feet below the surface of the road on the downhill side of the Parkway in the project area. Springs at the base of the rock cut develop into a stream from groundwater under the slide. Otherwise, the project area is a dry site (McElrath, 2006; Cherry, 2006). The surface waters of the small perennial stream could then drain into lower elevation waters classified as Outstanding Resource Waters (ORW) of the State in which water quality has one of the highest classifications.

Adjacent to the stream is a very small wetland area. This wetland is best described as a perennial seep. It is partially fed by a pipe coming out of the bank. It is narrow, not more than 4 feet wide on the slope, but extends more than 100 feet to the base of the slope. Plants dominating the seep were Impatiens during a July visit (McElrath, 2006).

A recent geotechnical analysis (FHWA, 2005) indicates that the slide at MP 270.3 is most likely caused from the weight of the material on the slip plane that pushes material down the slope. Subsurface drainage occurring between the fill plane and the subsurface bedrock is a contributing factor. The downward forces are resisted by the friction at the interface between soil and bedrock. Subsurface water increases the soil weight and acts as a lubricant along the interface between soil and bedrock, thus contributing to the slide. A subsurface drainage collector piping system was installed to divert seepage of water from beneath the Parkway fill plane.

Currently there is a rubble paved waterway that runs along the bottom of the cut slope to pipes on either side of the slide area. This system intercepts surface runoff and directs it away from the slide area. This system would need to remain in place for all alternatives to redirect surface water. If the ditch was removed in the bridge alternatives, grading underneath the bridge would concentrate the water into a swale and would cause erosion after leaving the regraded area since there is no existing natural channel. This system could remain in place without modification for the anchor block system. The inlet of the pipe culvert on the north end of the slide would need to be moved for bridge parapet construction to take place.

While some seepage water has been diverted, only a few of the drainage pipes installed continue to have significant water flow, and many pipes do not carry water at all. Monitoring of the drainage rate from the existing drainage system piping recorded drainage of approximately 1-gallon per minute emitting from all piping combined. However, the drainage rate could be considerably higher during the winter and spring wet season. Some years after the installation of this drainage system records indicate the slide continues to move downward towards the fill slope.

Methodology

Impact analyses on water resources, including wetlands, were based on recent assessments of the site by park and other NPS staff, previous studies or projects conducted within the same area, and assessment of potential changes in surface water and hydrology caused by road modifications.

The thresholds of change for the intensity of an impact on water resources are defined as follows:

Negligible: Impacts would not be detectable. Water quality parameters would be well below all water quality standards for the designated use of the water. No vegetation or wildlife effects associated with altered water quality would be evident. Action would cause no change in wetland area or function. Wetlands would not be affected or effects would be below or at the lower levels of detection. No long-term effects to wetlands would occur and any detectable effects would be considered slight, local, and would likely be short-term.

Minor: Impacts would be measurable, but water quality parameters would be well within all water quality standards for the designated use. State water quality and anti-degradation policy would not be violated. Changes in vegetation or wildlife use and health associated with water quality would be slight but measurable. Action would cause no change in wetland area and function. The action would affect a few individuals of plant or wildlife species within an existing wetland or riparian area. The change would

require considerable scientific effort to measure and have barely perceptible consequences to wetland or riparian habitat function. Effects to wetlands would be detectable and relatively small in terms of area and the nature of the change, and would likely be short-term.

Moderate: Changes in water quality would be measurable and readily apparent, but water quality parameters would be within all water quality standards for the designated use. State water quality and antidegradation policy would not be violated. Changes in vegetation and/or wildlife use and health associated with water quality would be measurable and readily apparent. Mitigation would be necessary to offset adverse effects, and would likely be successful. Action would change an existing wetland area or function, but the impact could be mitigated by the creation of artificial wetlands. The action would have a measurable effect on plant or wildlife species within an existing wetland or riparian area, but all species would remain indefinitely viable within the park. The alternative would result in effects to wetlands that would be readily apparent, including a long-term effect on wetland vegetation. Wetland or floodplain functions would not be affected in the long-term.

Major: Changes in water quality would be readily measurable, and some parameters would periodically be approached, equaled, or exceeded. State water quality regulations and antidegradation policy may be violated. Changes in vegetation and/or wildlife use and health associated with water quality would be measurable and readily apparent, even to a casual observer. Extensive mitigation measures would be necessary and their success would not be assured. Action would have drastic and permanent consequences for an existing wetland area or function which could not be certainly mitigated. Wetland and riparian species dynamics would be upset, and species would be at risk of extirpation from the park. Effects to wetlands would be observable over a relatively large area (regional scale) and would be long-term. The character of the wetland would be changed so that the functions typically provided by the wetland would be substantially changed.

The thresholds of change for the duration of an impact on water resources are defined as follows:

Short-term: Following implementation activities, recovery would take less than one year.
Long-term: Following implementation activities, recovery would take greater than one year.

Impacts of the No Action Alternative

Impacts Analysis
Under Alternative A, there would be no new impacts on water resources. No new causes for erosion, sedimentation, or surface water runoff would occur. However, any adverse impacts currently occurring would continue over the long-term, such as possible soil erosion due to slide movement with subsequent sedimentation of the stream. Additionally, water flow along the slide during storms could be causing siltation of groundwater. Overall, water quality would not change from current conditions.

Cumulative Effects
Water resources and wetlands in the Parkway are subject to damage from visitor access and natural processes. Past development, such as the construction of the Parkway, has resulted in impacts to water sources. Reasonably foreseeable actions, such as highway maintenance actions and visitor activity, could also affect water resources. Two future projects to repair and resurface nearby road sections and another to repair the nearby Goshen Creek Bridge are planned for FY 2007 through FY 2011. These projects could contribute adverse impacts on water resources if erosion occurs near water sources. The Developed Area Management Plan for the Cone Estate could identify additional visitor uses and construction of new facilities that could also affect water resources and wetlands. Given that implementation of Alternative A

would have very little if any impacts on water resources, Alternative A would contribute negligible, adverse cumulative impacts to water resources.

Conclusion
Alternative A would likely result in long-term, negligible, localized, direct adverse impacts to water resources from continued erosion and sedimentation due to slide movement. Alternative A would contribute negligible, adverse cumulative impacts to water resources. Because there would be no major adverse impacts to a resource or value whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park; 2) key to the natural or cultural integrity of the Park or to opportunities for enjoyment of the Park; or 3) identified as a goal in the Park's GMP or other relevant NPS planning documents, there would be no impairment of the Park's resources or values with respect to water resources.

Impacts of Alternative B (Anchor Blocks)

Impacts Analysis
Disturbance of road surfaces and embankments caused by excavation, grading, and recontouring during installation of anchor blocks increases the likelihood of soil erosion and sediment delivery to the small perennial stream. The effects to local water quality and hydrology would be adverse and short-term, but may or may not be detectable. Best management practices to control erosion and sediment release would be utilized during all construction activities. Identifying and staking the limits of clearing and grading, installing silt fences, establishing a controlled area for construction material and equipment, and preparing a sediment and erosion control plan would minimize the potential for adverse impacts to water quality, hydrology, and wetlands. Erosion control measures would be roughly equal since the down slope perimeter of disturbance requiring protection would be similar for both anchor block and bridge alternatives. With use of erosion control measures, it is not anticipated that potable surface water resources would be adversely affected. All disturbed areas would be revegetated after construction to stabilize soils, reducing long-term erosion and sedimentation.

Fuel products (petroleum, oils, and lubricants) would be needed to operate some of the equipment used to install the anchor blocks and repaving of the road; therefore, there is some risk of an accidental fuel or chemical spill, which could adversely affect water quality if the spill were to enter ground or surface water. To prevent accidental fuel or chemical spills, no fuels would be stored at the construction site and no refueling would occur near the stream. The fueling operation would be closely monitored, and an emergency spill kit, containing absorption pads, absorbent material, a shovel or rake, and other cleanup items, would be readily available on-site in the event of an accidental spill.

Surface drainage over the long-term would be handled by a system of culverts to channel flow. For the anchor block system, culverts beneath the Parkway would channel run off from natural drainage swales. As the anchor blocks would not alleviate sub-surface water flow during storms, siltation of the small stream and of groundwater would continue, contributing to long-term intermittent adverse effects on water quality which may or may not be detectable.

The subsurface piping that would be maintained and/or improved upon under this alternative would continue to divert water from beneath the slide area or slope where the slide is occurring and where this water affects slope instability. This subsurface piping would divert the water from beneath the slide slope and direct it to the toe of the slope. When released at the toe of the slope (where it cannot impact slope instability), the subsurface water collected would be released as surface drainage. However, the subsurface piping would not divert a significant amount of water from area streams or wetlands. Water quality of collected water or water released to surface drainage would not be impacted. It is assumed that

water released to surface drainage at the toe of the slide area slope would not contribute to slope erosion on the slopes below the slide area. A percentage of the water released at surface at the toe of the slide would again be absorbed into the subsurface ground water flow which also replenishes streams and wetland areas. Thus, the area and function of the wetland near the stream would remain unchanged.

Cumulative Effects

Water resources and wetlands in the Parkway are subject to damage from visitor access and natural processes. Past development, such as the construction of the Parkway, has resulted in impacts to water sources. Reasonably foreseeable actions, such as highway maintenance actions and visitor activity, could also affect water resources. Two future projects to repair and resurface nearby road sections and another to repair the nearby Goshen Creek Bridge are planned for FY 2007 through FY 2011. These projects could contribute adverse impacts on water resources if erosion occurs near water sources. The Developed Area Management Plan for the Cone Estate could identify additional visitor uses and construction of new facilities that could also affect water resources and wetlands. Given the larger impacts to water resources from past and future projects, implementation of Alternative B would have few impacts on water resources and would contribute negligible, adverse cumulative impacts to water resources.

Conclusion

Alternative B would likely result in short-term, minor, localized, direct adverse impacts on water resources from possible sedimentation and contamination during construction activities. Alternative B would contribute negligible, adverse cumulative impacts to water resources. Because there would be no major adverse impacts to a resource or value whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park; 2) key to the natural or cultural integrity of the Park or to opportunities for enjoyment of the Park; or 3) identified as a goal in the Park's GMP or other relevant NPS planning documents, there would be no impairment of the Park's resources or values with respect to water resources.

Impacts of Alternative C (Bridge with paved shoulders)

Impacts Analysis

Disturbance of road surfaces and embankments caused by excavation, grading, and recontouring during bridge construction increases the likelihood of soil erosion and sediment delivery to the small perennial stream. The effects to local water quality and hydrology would be adverse and short-term, but may or may not be detectable. Best management practices to control erosion and sediment release would be utilized during all construction activities. Identifying and staking the limits of clearing and grading, installing silt fences, establishing a controlled area for construction material and equipment, and preparing a sediment and erosion control plan would minimize the potential for adverse impacts to water quality, hydrology, and wetlands. Erosion control measures would be roughly equal since the down slope perimeter of disturbance requiring protection would be similar for both anchor block and bridge alternatives. With use of erosion control measures, it is not anticipated that potable surface water resources would be adversely affected. All disturbed areas would be reseeded after construction to stabilize soils, reducing long-term erosion and sedimentation.

Fuel products (petroleum, oils, and lubricants) would be needed to operate some of the equipment used to remove the old section of road and construct the bridge; therefore, there is some risk of an accidental fuel or chemical spill, which could adversely affect water quality if the spill were to enter ground or surface water. To prevent accidental fuel or chemical spills, no fuels would be stored at the construction site and no refueling would occur near the stream. The fueling operation would be closely monitored, and an emergency spill kit, containing absorption pads, absorbent material, a shovel or rake, and other cleanup items, would be readily available on-site in the event of an accidental spill.

Surface drainage for this project would be handled by a system of culverts to channel flow. For this bridge alternative, flow could naturally occur beneath the bridge or through culverts placed beneath the Parkway.

The subsurface piping that would be maintained and/or improved upon under this alternative would continue to divert water from beneath the slide area or slope where the slide is occurring and where this water affects slope instability. This subsurface piping would divert the water from beneath the slide slope and direct it to the toe of the slope. When released at the toe of the slope (where it cannot impact slope instability), the subsurface water collected would be released as surface drainage. However, the subsurface piping would not divert a significant amount of water from area streams or wetlands. Water quality of collected water or water released to surface drainage would not be impacted. It is assumed that water released to surface drainage at the toe of the slide area slope would not contribute to slope erosion on the slopes below the slide area. A percentage of the water released at surface at the toe of the slide would again be absorbed into the subsurface ground water flow which also replenishes streams and wetland areas. Thus, the area and function of the wetland near the stream would remain unchanged.

Cumulative Effects
Water resources and wetlands in the Parkway are subject to damage from visitor access and natural processes. Past development, such as the construction of the Parkway, has resulted in impacts to water sources. Reasonably foreseeable actions, such as highway maintenance actions and visitor activity, could also affect water resources. Two future projects to repair and resurface nearby road sections and another to repair the nearby Goshen Creek Bridge are planned for FY 2007 through FY 2011. These projects could contribute adverse impacts on water resources if erosion occurs near water sources. The Developed Area Management Plan for the Cone Estate could identify additional visitor uses and construction of new facilities that could also affect water resources and wetlands. Given the larger impacts to water resources from past and future projects, implementation of Alternative C would have few impacts on water resources and would contribute negligible, adverse cumulative impacts to water resources.

Conclusion
Alternative C would likely result in short-term, minor, localized, direct adverse impacts on water resources from possible sedimentation and contamination during construction activities. Alternative C would contribute negligible, adverse cumulative impacts to water resources. Because there would be no major adverse impacts to a resource or value whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park; 2) key to the natural or cultural integrity of the Park or to opportunities for enjoyment of the Park; or 3) identified as a goal in the Park's GMP or other relevant NPS planning documents, there would be no impairment of the Park's resources or values with respect to water resources.

Impacts of Alternative D (Bridge with grassy shoulders)

Impacts Analysis
Disturbance of road surfaces and embankments caused by excavation, grading, and recontouring during bridge construction increases the likelihood of soil erosion and sediment delivery to the small perennial stream. The effects to local water quality and hydrology would be adverse and short- term, but may or may not be detectable. Best management practices to control erosion and sediment release would be utilized during all construction activities. Identifying and staking the limits of clearing and grading, installing silt fences, establishing a controlled area for construction material and equipment, and preparing a sediment and erosion control plan would minimize the potential for adverse impacts to water quality, hydrology, and wetlands. Erosion control measures would be roughly equal since the down slope

perimeter of disturbance requiring protection would be similar for both anchor block and bridge alternatives. With use of erosion control measures, it is not anticipated that potable surface water resources would be adversely affected. All disturbed areas would be reseeded after construction to stabilize soils, reducing long-term erosion and sedimentation.

Fuel products (petroleum, oils, and lubricants) would be needed to operate some of the equipment used to remove the old section of road and construct the bridge; therefore, there is some risk of an accidental fuel or chemical spill, which could adversely affect water quality if the spill were to enter ground or surface water. To prevent accidental fuel or chemical spills, no fuels would be stored at the construction site and no refueling would occur near the stream. The fueling operation would be closely monitored, and an emergency spill kit, containing absorption pads, absorbent material, a shovel or rake, and other cleanup items, would be readily available on-site in the event of an accidental spill.

Surface drainage for this project would be handled by a system of culverts to channel flow. For this bridge alternative, flow could naturally occur beneath the bridge or through culverts placed beneath the Parkway.

The subsurface piping that would be maintained and/or improved upon under this alternative would continue to divert water from beneath the slide area or slope where the slide is occurring and where this water affects slope instability. This subsurface piping would divert the water from beneath the slide slope and direct it to the toe of the slope. When released at the toe of the slope (where it cannot impact slope instability), the subsurface water collected would be released as surface drainage. However, the subsurface piping would not divert a significant amount of water from area streams or wetlands. Water quality of collected water or water released to surface drainage would not be impacted. It is assumed that water released to surface drainage at the toe of the slide area slope would not contribute to slope erosion on the slopes below the slide area. A percentage of the water released at surface at the toe of the slide would again be absorbed into the subsurface ground water flow which also replenishes streams and wetland areas. Thus, the area and function of the wetland near the stream would remain unchanged.

Cumulative Effects

Water resources and wetlands in the Parkway are subject to damage from visitor access and natural processes. Past development, such as the construction of the Parkway, has resulted in impacts to water sources. Reasonably foreseeable actions, such as highway maintenance actions and visitor activity, could also affect water resources. Two future projects to repair and resurface nearby road sections and another to repair the nearby Goshen Creek Bridge are planned for FY 2007 through FY 2011. These projects could contribute adverse impacts on water resources if erosion occurs near water sources. The Developed Area Management Plan for the Cone Estate could identify additional visitor uses and construction of new facilities that could also affect water resources and wetlands. Given the larger impacts to water resources from past and future projects, implementation of Alternative D would have few impacts on water resources and would contribute negligible, adverse cumulative impacts to water resources.

Conclusion

Alternative D would likely result in short-term, minor, localized, direct adverse impacts on water resources from possible sedimentation and contamination during construction activities. Alternative D would contribute negligible, adverse cumulative impacts to water resources. Because there would be no major adverse impacts to a resource or value whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park; 2) key to the natural or cultural integrity of the Park or to opportunities for enjoyment of the Park; or 3) identified as a goal in the Park's GMP or other relevant NPS planning documents, there would be no impairment of the Park's resources or values with respect to water resources.

VEGETATION

Affected Environment

There are 14 major vegetation types identified at the Parkway with currently over 1,400 species of vascular plants, though this number may well likely approach 2,000 species as the park begins an extensive inventory of all plants and animals (NPS, no date). The flora of the Blue Ridge Parkway is so diverse for reasons such as climatic variability, large north-south geographic range, diverse geologic substrate, and many different micro-habitats.

The project area is located in a deciduous mixed hardwood cove forest community with a full canopy, shrub layer and herb layer (McElrath, 2006). On the slope below the road, the vegetation is more open where previous work has been performed. The dominant tree species is tulip poplar (*Liriodendron tulipifera*). Other canopy species include black locust (*Robinia pseudoacacia*), oaks (*Quercus* spp.), hickories (*Carya* spp.), sweet birch (*Betula lenta*), yellow birch (*Betula alleghaniensis*), red maple (*Acer rubra*), sugar maple (*Acer saccharum*), black cherry (*Prunus serotina*), and white pine (*Pinus strobus*). Dominant understory species include flowering dogwood (*Cornus florida*), striped maple (*Acer pensylvanicum*), hickories (*Carya* spp.), and wild hydrangea (*Hydrangea arborescens*). Common herbaceous stratum plants include Christmas fern (*Polystichum acrostichoides*), Virginia creeper, (*Parthenocissus quinquefolia*), impatiens (*Impatiens* spp.), tall bellflower (*Campanula americana*), common yarrow (*Achillea millefolium*), evening primrose (*Oenothera biennis*), beebalm (*Monarda* spp.), wild grapes (*Vitus* spp.), Virginia spiderwort (*Tradescantia virginiana*), tall thimbleweed (*Anemone virginiana*), bloodroot (*Sanguinaria canadensis*), dayflower (*Commelina communis*), asters (*Aster* spp.), poison ivy (*Rhus radicans*), black bugbane (*Cimicifuga racemosa*), jack in the pulpit (*Arisaema triphyllum*), sumac (*Rumex* spp.), milkweed (*Asplenium* spp.), and rattlesnake fern (*Botrychium virginianum*).

Four non-native exotic plants species have been observed at the project site (McElrath, 2006). Japanese stilt grass (*Microstegium vimineum*) is abundant in the area covering more than 10 meters square with fairly high (25-50%) coverage in places. There are two clumps of multiflora rose (*Rosa multiflora*); one covering an area greater than 10 meters square, the other (on Parkway Right) is smaller. One patch of coltsfoot (*Tussilago farfara*) covers approximately 5 meters square. Crown vetch (*Coronilla varia*) is somewhat scattered with the largest patch less than five meters square. Any further soil disturbance may contribute to the spread of these species in the area.

There are no federally listed plant species in the project area.

Methodology

This impact analysis focuses on vegetation that is considered most likely to be affected by the project. Information on vegetation was derived from observations made in the field, previous projects conducted within the same area, and consultation with park staff. The impact analysis examines the potential changes to vegetation that may occur as a result of project implementation.

The thresholds of change for the intensity of an impact on vegetation are defined as follows:

Negligible: No native vegetation would be affected or some individual native plants could be affected as a result of the alternative, but measurable or perceptible changes in plant community size, integrity, or continuity would not occur. The effects would be short-term and on a small scale. Impacts would be well within the range of natural fluctuations.

Minor: Effects to native plants would be measurable or perceptible, but would be localized within a small area. The viability of the plant community would not be affected and the community, if left alone, would recover quickly. Impacts would not be expected to be outside the natural range of variability and would not be expected to have any long-term effects on native species, their habitats, or the natural processes sustaining them.

Moderate: The alternative would affect some individual native plants and would also affect a sizeable segment of the species' population in the long-term and over a relatively large area. A change would occur to the native community over a relatively large area that would be readily measurable in terms of abundance, distribution, quantity, or quality. Impacts could be outside the range of natural variability for short periods of time. Mitigation measures to offset/minimize adverse effects would be necessary and would likely be successful.

Major: The alternative would have a considerable long-term effect on native plant populations and affect a relatively large area in and out of the park. Impacts would be expected to be outside the natural range of variability for long periods of time or to be permanent. Extensive mitigation measures would be needed to offset any adverse effects and their success would not be guaranteed.

The thresholds of change for the duration of an impact on vegetation are defined as follows:

Short-term: Recovers in one to three years or less.
Long-term: Takes more than three years to recover.

Impacts of the No Action Alternative

Impacts Analysis
As there would not be any new actions under Alternative A, there would not be any new impacts on vegetation. There would be no need to clear the vegetation, and the surrounding forest would continue to exist as it is. However, continued cyclic maintenance of the road at MP 270.3 could cause short-term vegetation damage, such as trampling or clearing, along the roadside from heavy equipment or foot traffic.

Cumulative Effects
Plants along the Parkway are subject to damage from natural processes, visitor access, and road maintenance. Past and future exotic plant control efforts beneficially contribute toward restoring habitat for native species. Two future projects to repair and resurface nearby road sections and another to repair the nearby Goshen Creek Bridge are planned for 2007 through 2011. These projects would contribute adverse cumulative impacts on vegetation, such as trampling and clearing. The Developed Area Management Plan for the Cone Estate could identify additional visitor uses and construction of new facilities that could also affect vegetation. Although no new construction would occur under the No Action Alternative, there would be short-term, negligible, adverse cumulative effects on vegetation a result of continued cyclic maintenance.

Conclusion
There would be short-term, negligible, local, direct adverse impacts to the vegetation as a result of the No Action Alternative due to continued cyclic maintenance of the road. Alternative A would contribute negligible, adverse cumulative impacts on vegetation. Because there would be no major adverse impacts to a resource or value whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park; 2) key to the natural or cultural integrity of the Park

or to opportunities for enjoyment of the Park; or 3) identified as a goal in the Park's GMP or other relevant NPS planning documents, there would be no impairment of the Park's resources or values with respect to vegetation.

Impacts of Alternative B (Anchor Blocks)

Impacts Analysis

Construction activities associated with Alternative B would necessitate removal of plants located at the project site for installation of anchor blocks. Trees and ground cover would be removed from the slide area for site preparation. Repeated disturbance of vegetation (i.e., due to vehicle passes or foot traffic) during construction in areas where plants are not cleared would cause damage to plants and destruction of the vegetation mat.

It is estimated that a total of 0.78 acres would be disturbed, of which 0.68 acres is forested. Although the anchor blocks would be buried, they would probably impact future tree growth. Therefore, of the total disturbed area, 0.32 acres would be permanently impacted where trees could not grow again directly over set in place anchor blocks. The slope wedges with the anchor block would be covered over with fill soils, topsoil, and seeded with grass to prevent erosion. Native trees would be planted over the covered anchor blocks, between the rows, to revegetate the forested area.

Exotic plants or seeds could be brought to the site with fill material or topsoil. New introductions could allow for exotic plants to become established and spread, especially in areas where the ground is disturbed by construction activities. Exotic plants currently growing in the area can also become established and spread on newly disturbed substrates. However, mitigation to ensure that imported material does not contain exotic plant material would be implemented.

As the anchor blocks would be stored and staged outside of the Parkway, there would not be any additional vegetation impacts from this activity.

Cumulative Effects

Plants along the Parkway are subject to damage from natural processes, visitor access, and road maintenance. Past and future exotic plant control efforts beneficially contribute toward restoring habitat for native species. Two future projects to repair and resurface nearby road sections and another to repair the nearby Goshen Creek Bridge are planned for FY 2007 through FY 2011. These projects would contribute adverse cumulative impacts on vegetation, such as trampling and clearing. The Developed Area Management Plan for the Cone Estate could identify additional visitor uses and construction of new facilities that could also affect vegetation. Given the significant soil impacts from original construction of the Parkway, along with numerous other road work projects, the adverse impacts on vegetation from Alternative B would likely produce negligible, adverse cumulative impacts on vegetation.

Conclusion

Alternative B would likely result in short-term, minor, localized, direct adverse impacts on vegetation from construction activities. Alternative B would contribute negligible, adverse cumulative impacts on vegetation. Because there would be no major adverse impacts to a resource or value whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park; 2) key to the natural or cultural integrity of the Park or to opportunities for enjoyment of the Park; or 3) identified as a goal in the Park's GMP or other relevant NPS planning documents, there would be no impairment of the Park's resources or values with respect to vegetation.

Impacts of Alternative C (Bridge with paved shoulders)

Impacts Analysis

Bridge construction activities associated with the Alternative C would disturb an estimated total of 0.33 acres of unpaved area. Little to no forest area would be disturbed, though a few trees (.05 acres) may be removed on the cut slope side of the Parkway to create ground clearance for the bridge. All disturbances would be temporary from construction impacts.

Repeated disturbance of vegetation (i.e., due to vehicle passes or foot traffic) during construction in areas where plants are not cleared would cause damage to plants and destruction of the vegetation mat. However, the majority of disturbance would occur in previously disturbed areas, and as roadside vegetation is often sparse, adverse vegetation impacts would be minimized. Upon completion of bridge construction, the area would be reseeded in the immediate vicinity of construction activities. As there would be little to no impact on forested areas, forest revegetation should not be necessary.

Exotic plants or seeds could be brought to the site with construction equipment. New introductions could allow for exotic plants to become established and spread, especially in areas where the ground is disturbed by construction activities. Exotic plants currently growing in the area can also become established and spread on newly disturbed substrates. However, mitigation to ensure that imported material does not contain exotic plant material would be implemented.

Construction materials would be staged at the adjacent Lewis Fork Parking Overlook. Although materials would be staged on paved surfaces, it is possible that a small area of vegetation adjacent to the paved surfaces would be trampled from foot traffic or heavy equipment.

Cumulative Effects

Plants along the Parkway are subject to damage from natural processes, visitor access, and road maintenance. Past and future exotic plant control efforts beneficially contribute toward restoring habitat for native species. Two future projects to repair and resurface nearby road sections and another to repair the nearby Goshen Creek Bridge are planned for FY 2007 through FY 2011. These projects would contribute adverse cumulative impacts on vegetation, such as trampling and clearing. The Developed Area Management Plan for the Cone Estate could identify additional visitor uses and construction of new facilities that could also affect vegetation. Given the significant soil impacts from original construction of the Parkway, along with numerous other road work projects, the few adverse impacts on vegetation from Alternative C would likely produce negligible, adverse cumulative impacts on vegetation.

Conclusion

Alternative C would likely result in short-term, minor, localized, direct adverse impacts on vegetation from construction activities. Alternative C would contribute negligible, adverse cumulative impacts on vegetation. Because there would be no major adverse impacts to a resource or value whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park; 2) key to the natural or cultural integrity of the Park or to opportunities for enjoyment of the Park; or 3) identified as a goal in the Park's GMP or other relevant NPS planning documents, there would be no impairment of the Park's resources or values with respect to vegetation.

Impacts of Alternative D (Bridge with grassy shoulders)

Impacts Analysis

Construction activities associated with the Alternative D would disturb an estimated total of 0.33 acres of unpaved area. Little to no forest area would be disturbed, though a few trees (.05 acres) may be removed

on the cut slope side of the Parkway to create ground clearance for the bridge. All disturbances would be temporary from construction impacts.

Repeated disturbance of vegetation (i.e., due to vehicle passes or foot traffic) during construction in areas where plants are not cleared would cause damage to plants and destruction of the vegetation mat. However, the majority of disturbance would occur in previously disturbed areas, and as roadside vegetation is often sparse, adverse vegetation impacts would be minimized. Upon completion of bridge construction, bridge shoulders would be seeded with grass as well as any other areas disturbed by construction activities. As there would be little to no impact on forested areas, forest revegetation should not be necessary.

Exotic plants or seeds could be brought to the site with construction equipment or topsoil. New introductions could allow for exotic plants to become established and spread, especially in areas where the ground is disturbed by construction activities. Exotic plants currently growing in the area can also become established and spread on newly disturbed substrates. However, mitigation to ensure that imported material does not contain exotic plant material would be implemented.

Construction materials would be staged at the adjacent Lewis Fork Parking Overlook. Although materials would be staged on paved surfaces, it is possible that a small area of vegetation adjacent to the paved surfaces would be trampled from foot traffic or heavy equipment.

Cumulative Effects
Plants along the Parkway are subject to damage from natural processes, visitor access, and road maintenance. Past and future exotic plant control efforts beneficially contribute toward restoring habitat for native species. Two future projects to repair and resurface nearby road sections and another to repair the nearby Goshen Creek Bridge are planned for FY 2007 through FY 2011. These projects would contribute adverse cumulative impacts on vegetation, such as trampling and clearing. The Developed Area Management Plan for the Cone Estate could identify additional visitor uses and construction of new facilities that could also affect vegetation. Given the significant soil impacts from original construction of the Parkway, along with numerous other road work projects, the few adverse impacts on vegetation from Alternative D would likely produce negligible, adverse cumulative impacts on vegetation.

Conclusion
Alternative D would likely result in short-term, minor, localized, direct adverse impacts on vegetation from construction activities. Alternative D would contribute negligible, adverse cumulative impacts on vegetation. Because there would be no major adverse impacts to a resource or value whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park; 2) key to the natural or cultural integrity of the Park or to opportunities for enjoyment of the Park; or 3) identified as a goal in the Park's GMP or other relevant NPS planning documents, there would be no impairment of the Park's resources or values with respect to vegetation.

WILDLIFE

Affected Environment

Over 50 species of mammals, more than 40 species of reptiles, almost 50 species of amphibians, and more than 50 species of fish can be found on Parkway lands. Over 150 species of birds are known to nest here with dozens of others passing through during fall and spring migrations (NPS, no date). Wildlife use habitat in the vicinity of the project area for a variety of purposes: shelter, cover and concealment, forage, and nesting/roosting sites.

The site is not considered to be biologically significant (Cherry, 2006), although many common species occur there. Commonly seen mammals include white-tailed deer, black bear, bobcat, fox, raccoon, gray squirrel, groundhog, eastern cottontail, and Virginia opossum (McElrath, 2006). Numerous salamanders can be found in the seep below the road, as well as several species of caddisfly. Salamanders at the wetland area are mostly the Allegheny mountain dusky salamander. The project site is too dry for frogs and many species of turtles and salamanders. Reptiles observed at the site include the eastern box turtle, black snakes, and garter snakes (McElrath, 2006; Cherry, 2006). There are no fish in the small perennial stream.

Characteristic bird species observed in the area include black-throated green warbler, ruby-throated hummingbird, eastern wood pewee, red-eyed vireo, American goldfinch, white-breasted nuthatch, American robin, eastern or rufous-sided towhee, northern cardinal, blue jay, pileated woodpecker, tufted titmouse, ovenbird, dark-eyed Junco, Carolina chickadee, indigo bunting, black and white warbler, scarlet tanager, rose-breasted grosbeak (McElrath, 2006).

According to BLRI staff, there are no federally listed threatened or endangered animals or rare species at the project site (McElrath, 2006; Cherry, 2006). However, cerulean warblers (*Dendroica cerulea*), a federal species of concern and significantly rare in North Carolina, are known to breed within 0.2 to 0.5 miles of this site (Cherry, 2006). The cerulean warbler, a small neotropical migratory bird, nests and raises young in large tracts of deciduous hardwood forests that have tall, large diameter trees with an open understory (USFWS, 2002). The breeding season is from April to August. From mid-April into May, male cerulean warblers are singing to attract mates. Females build nests in the mid and upper branches of deciduous trees and eggs are laid in May and June. Cerulean warblers are experiencing population declines in parts of its range and habitat loss. As they do not occur on small tracts of forest, many remaining forested lands are no longer suitable habitat because they have been fragmented into a patchwork of small wooded islands.

Methodology

This impact analysis focuses on wildlife and wildlife habitat that are considered most likely to be affected by the project. Information on wildlife habitats and species potentially present was derived from observations made in the field, previous projects conducted within the same area, and consultation with park staff. The impact analysis examines the potential changes to wildlife, habitat and use of the project area that may occur as a result of project implementation.

The thresholds of change for the intensity of an impact on wildlife are defined as follows:

Negligible: Wildlife and their habitats would not be affected or the effects would be at or below the level of detection, would be short-term, and the changes would be so slight that they would not be of any measurable or perceptible consequence to wildlife populations. Impacts would be well within the range of natural fluctuations.

Minor: Effects on wildlife or habitats would be measurable or perceptible, but localized within a small area. While the mortality of individual animals might occur, the viability of wildlife populations would not be affected and the community, if left alone, would recover. Impacts would not be expected to be outside the natural range of variability and would not be expected to have any long-term effects on native species, their habitats, or the natural processes sustaining them. Sufficient habitat would remain functional to maintain viability of all species.

Moderate: A change in wildlife populations or habitats would occur over a relatively large area. Effects to wildlife would be readily detectable, long-term, and with consequences at the population level. The change would be readily measurable in terms of abundance, distribution, quantity, or quality of population. 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. Impacts could be outside the natural range of variability for short periods of time. Sufficient habitat would remain functional to maintain variability of all native wildlife species. Mitigation measures would be necessary to offset adverse effects, and would likely be successful.

Major: Effects on wildlife populations or habitats would be readily apparent, long-term, and would substantially change wildlife populations over a large area in and out of the national park. Impacts would be expected to be outside the natural range of variability for long periods of time or to be permanent. Loss of habitat may affect the viability of at least some native species. Extensive mitigation would be needed to offset adverse effects, and the success of mitigation measures could not be assured.

The thresholds of change for the duration of an impact on wildlife and habitat are defined as follows:

Short-term: Recovers in one to three years or less.
Long-term: Takes more than three years to recover.

Impacts of the No Action Alternative

Impacts Analysis
As there would not be any new actions under Alternative A, there would not be any impacts on wildlife or wildlife habitat. There would not be additional human activity in the area for construction activities, so wildlife would not be affected beyond current disturbance from regular vehicle traffic. Cyclic maintenance activities that would continue periodically under this alternative would have temporary impacts on wildlife as animals may get displaced during human activity.

Cumulative Effects
Wildlife and habitat along the Parkway are subject to disturbance and damage from natural processes, visitor access, road maintenance, and traffic. There would be continued adverse effects on wildlife from vehicles using the roadway. Vehicles passing along the road cause short- term, local disturbance or displacement of wildlife directly in the road corridor. Effects of the road on wildlife include mortality, restricted movement, introduction of exotic plants that could affect wildlife habitat, habitat fragmentation and edge effect, and increased human access to wildlife habitats.

Wildlife habitat in the vicinity of the project area has been previously disturbed by the construction of the Parkway, previous efforts to stabilize the road, and continuing human activity, especially vehicular traffic, all of which contribute to the disturbed nature of the existing habitat.

Two future projects to repair and resurface nearby road sections and another to repair the nearby Goshen Creek Bridge are planned for FY 2007 through FY 2011. These projects would contribute adverse cumulative impacts on wildlife, such as temporary displacement and habitat damage. The Developed Area Management Plan for the Cone Estate could identify additional visitor uses and construction of new facilities that could also affect wildlife. Given these past, present, and future actions, the temporary impacts on wildlife from continued cyclic maintenance in Alternative A would likely produce negligible, adverse cumulative impacts on wildlife.

Conclusion
Alternative A would likely result in short-term, negligible, localized, direct adverse impacts on wildlife and habitat from continued cyclic maintenance. Alternative A would contribute negligible, adverse cumulative impacts to wildlife. Because there would be no major adverse impacts to a resource or value whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park; 2) key to the natural or cultural integrity of the Park or to opportunities for enjoyment of the Park; or 3) identified as a goal in the Park's GMP or other relevant NPS planning documents, there would be no impairment of the Park's resources or values with respect to wildlife.

Impacts of Alternative B (Anchor Blocks)

Impacts Analysis
Construction activities for installation of the anchor blocks and human presence would cause temporary displacement and disturbance of resident wildlife for the seven months duration of construction. Species are expected to return to the area after construction is completed. Some species may be prevented from using the resources on the project site due to habitat alteration until the cleared forest is reestablished. However, a large forested area surrounds the project site which would provide appropriate habitat. These impacts would be localized and limited to the immediate area of the project site.

It is estimated that a total of 0.78 acres of wildlife habitat would be disturbed, of which 0.68 acres is forested. Although the anchor blocks would be buried, they would probably impact future tree growth. Therefore, of the total disturbed area, 0.32 acres would be permanently impacted where trees could not grow again directly over set in place anchor blocks. The slope wedges with the anchor block would be covered over with fill soils, topsoil, and seeded with grass to prevent erosion. Native trees would be planted over the covered anchor blocks, between the rows, to revegetate the forested area.

As construction would be scheduled to occur between November 1 and June 1, there could be some disturbance of cerulean warblers at the start of their breeding season. From mid-April into May male cerulean warblers are singing to attract mates and are more easily disturbed than later in the season. As the nests are built and eggs laid the birds are increasingly less likely to be disturbed but this is still possible if noise and disturbance is excessive. While these birds do put up with traffic noises from the road, they have also been known to be disturbed at times by excessive noise (such as motorcycles). Therefore, excessive noise as could be produced by heavy equipment used in construction could temporarily disturb cerulean warblers for part of one breeding season. However, given that the closest cerulean warblers are known to breed 0.2 to 0.5 miles away from the project site, disturbance may be lessened as noise attenuates with distance from the source.

As the anchor blocks would be stored and staged outside of the Parkway, there would be additional vehicle traffic to transport materials to the project site. This louder than usual traffic (i.e., big trucks) would disturb wildlife along several miles of the road corridor from the entry point onto the Parkway up to the project site. Disturbance would be temporary as it would only last for small portions of work days during the seven month construction period.

Cumulative Effects
Wildlife and habitat along the Parkway are subject to disturbance and damage from natural processes, visitor access, road maintenance, and traffic. There would be continued adverse effects on wildlife from vehicles using the roadway. Vehicles passing along the road cause short- term, local disturbance or displacement of wildlife directly in the road corridor. Effects of the road on wildlife include mortality, restricted movement, introduction of exotic plants that could affect wildlife habitat, habitat fragmentation and edge effect, and increased human access to wildlife habitats.

Wildlife habitat in the vicinity of the project area has been previously disturbed by the construction of the Parkway, previous efforts to stabilize the road, and continuing human activity, especially vehicular traffic, all of which contribute to the disturbed nature of the existing habitat.

Two future projects to repair and resurface nearby road sections and another to repair the nearby Goshen Creek Bridge are planned for FY 2007 through FY 2011. These projects would contribute adverse cumulative impacts on wildlife, such as temporary displacement and habitat damage. The Developed Area Management Plan for the Cone Estate could identify additional visitor uses and construction of new facilities that could also affect wildlife. Given these past, present, and future actions, the temporary impacts on wildlife from installation of anchor blocks in Alternative B would likely produce minor, adverse cumulative impacts on wildlife.

Conclusion
Alternative B would likely result in short-term, minor, localized, direct adverse impacts on wildlife and habitat from construction activities. Alternative B would contribute minor, adverse cumulative impacts to wildlife. Because there would be no major adverse impacts to a resource or value whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park; 2) key to the natural or cultural integrity of the Park or to opportunities for enjoyment of the Park; or 3) identified as a goal in the Park's GMP or other relevant NPS planning documents, there would be no impairment of the Park's resources or values with respect to wildlife.

Impacts of Alternative C (Bridge with paved shoulders)

Impacts Analysis
Bridge construction activities and human presence would cause temporary displacement and disturbance of resident wildlife for the one to two year duration of construction. Species are expected to return to the area after construction is completed. It is estimated that a total of 0.33 acres of unpaved area would be disturbed. Little to no forest habitat would be disturbed, though a few trees (.05 acres) may be removed on the cut slope side of the Parkway to create ground clearance for the bridge. The forested area surrounding the project site would provide appropriate habitat for any habitat that is temporarily lost. These impacts would be localized and limited to the immediate area of the project site. All disturbed areas would be reseeded after construction. As there would be little to no impact on forested areas, forest revegetation should not be necessary for restoration of forested habitat.

As construction would take at least one year and possible two, there could be some disturbance of cerulean warblers during one or two breeding seasons (mid-April through August). From mid-April into May male cerulean warblers are singing to attract mates and are more easily disturbed than later in the season. As the nests are built and eggs laid the birds are increasingly less likely to be disturbed but this is still possible if noise and disturbance is excessive. While these birds do put up with traffic noises from the road, they have also been known to be disturbed at times by excessive noise (such as motorcycles). Therefore, excessive noise as could be produced by heavy equipment used in construction could temporarily disturb cerulean warblers for one or two breeding seasons. However, given that the closest cerulean warblers are known to breed 0.2 to 0.5 miles away from the project site, disturbance may be lessened as noise attenuates with distance from the source.

As construction materials would be staged at the adjacent Lewis Fork Parking Overlook, there would be additional vehicle traffic used to transport materials to the staging area. This louder than usual traffic (i.e., big trucks) would disturb wildlife along several miles of the road corridor from the entry point onto the Parkway up to the overlook. Disturbance would be temporary as it would only occur occasionally

during the construction period. Vehicles moving between the overlook and the project site would also cause wildlife disturbance, but the distance would be short and can be considered part of the overall construction activities.

Cumulative Effects
Wildlife and habitat along the Parkway are subject to disturbance and damage from natural processes, visitor access, road maintenance, and traffic. There would be continued adverse effects on wildlife from vehicles using the roadway. Vehicles passing along the road cause short- term, local disturbance or displacement of wildlife directly in the road corridor. Effects of the road on wildlife include mortality, restricted movement, introduction of exotic plants that could affect wildlife habitat, habitat fragmentation and edge effect, and increased human access to wildlife habitats.

Wildlife habitat in the vicinity of the project area has been previously disturbed by the construction of the Parkway, previous efforts to stabilize the road, and continuing human activity, especially vehicular traffic, all of which contribute to the disturbed nature of the existing habitat.

Two future projects to repair and resurface nearby road sections and another to repair the nearby Goshen Creek Bridge are planned for FY 2007 through FY 2011. These projects would contribute adverse cumulative impacts on wildlife, such as temporary displacement and habitat damage. The Developed Area Management Plan for the Cone Estate could identify additional visitor uses and construction of new facilities that could also affect wildlife. Given these past, present, and future actions, the temporary impacts on wildlife from installation of anchor blocks in Alternative C would likely produce minor, adverse cumulative impacts on wildlife.

Conclusion
Alternative C would likely result in short-term, minor to moderate, localized, direct adverse impacts on wildlife and habitat from construction activities, with special emphasis on impacts of cerulean warblers for more than one breeding season. Alternative C would contribute minor, adverse cumulative impacts to wildlife. Because there would be no major adverse impacts to a resource or value whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park; 2) key to the natural or cultural integrity of the Park or to opportunities for enjoyment of the Park; or 3) identified as a goal in the Park's GMP or other relevant NPS planning documents, there would be no impairment of the Park's resources or values with respect to wildlife.

Impacts of Alternative D (Bridge with grassy shoulders)

Impacts Analysis
Bridge construction activities and human presence would cause temporary displacement and disturbance of resident wildlife for the one to two year duration of construction. Species are expected to return to the area after construction is completed. It is estimated that a total of 0.33 acres of unpaved area would be disturbed. Little to no forest habitat would be disturbed, though a few trees (.05 acres) may be removed on the cut slope side of the Parkway to create ground clearance for the bridge. The forested area surrounding the project site would provide appropriate habitat for any habitat that is temporarily lost. These impacts would be localized and limited to the immediate area of the project site. All disturbed areas would be reseeded after construction. As there would be little to no impact on forested areas, forest revegetation should not be necessary for restoration of forested habitat.

As construction would take at least one year and possible two, there could be some disturbance of cerulean warblers during one or two breeding seasons (mid-April through August). From mid-April into May male cerulean warblers are singing to attract mates and are more easily disturbed than later in the

season. As the nests are built and eggs laid the birds are increasingly less likely to be disturbed but this is still possible if noise and disturbance is excessive. While these birds do put up with traffic noises from the road, they have also been known to be disturbed at times by excessive noise (such as motorcycles). Therefore, excessive noise as could be produced by heavy equipment used in construction could temporarily disturb cerulean warblers for one or two breeding seasons. However, given that the closest cerulean warblers are known to breed 0.2 to 0.5 miles away from the project site, disturbance may be lessened as noise attenuates with distance from the source.

As construction materials would be staged at the adjacent Lewis Fork Parking Overlook, there would be additional vehicle traffic used to transport materials to the staging area. This louder than usual traffic (i.e., big trucks) would disturb wildlife along several miles of the road corridor from the entry point onto the Parkway up to the overlook. Disturbance would be temporary as it would only occur occasionally during the construction period. Vehicles moving between the overlook and the project site would also cause wildlife disturbance, but the distance would be short and can be considered part of the overall construction activities.

Cumulative Effects

Wildlife and habitat along the Parkway are subject to disturbance and damage from natural processes, visitor access, road maintenance, and traffic. There would be continued adverse effects on wildlife from vehicles using the roadway. Vehicles passing along the road cause short- term, local disturbance or displacement of wildlife directly in the road corridor. Effects of the road on wildlife include mortality, restricted movement, introduction of exotic plants that could affect wildlife habitat, habitat fragmentation and edge effect, and increased human access to wildlife habitats.

Wildlife habitat in the vicinity of the project area has been previously disturbed by the construction of the Parkway, previous efforts to stabilize the road, and continuing human activity, especially vehicular traffic, all of which contribute to the disturbed nature of the existing habitat.

Two future projects to repair and resurface nearby road sections and another to repair the nearby Goshen Creek Bridge are planned for FY 2007 through FY 2011. These projects would contribute adverse cumulative impacts on wildlife, such as temporary displacement and habitat damage. The Developed Area Management Plan for the Cone Estate could identify additional visitor uses and construction of new facilities that could also affect wildlife. Given these past, present, and future actions, the temporary impacts on wildlife from installation of anchor blocks in Alternative D would likely produce minor, adverse cumulative impacts on wildlife.

Conclusion

Alternative D would likely result in short-term, minor to moderate, localized, direct adverse impacts on wildlife and habitat from construction activities, with special emphasis on impacts of cerulean warblers for more than one breeding season. Alternative D would contribute minor, adverse cumulative impacts to wildlife. Because there would be no major adverse impacts to a resource or value whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park; 2) key to the natural or cultural integrity of the Park or to opportunities for enjoyment of the Park; or 3) identified as a goal in the Park's GMP or other relevant NPS planning documents, there would be no impairment of the Park's resources or values with respect to wildlife.

VISITOR USE AND EXPERIENCE, INCLUDING RECREATION AND VISUAL RESOURCES

Affected Environment

A trip down the Parkway provides stunning, long range vistas and close-up looks at the natural and cultural history of the southern Appalachian Mountains. The 469 mile drive is designed as a drive-awhile and stop-awhile experience intended to encourage leisurely progress and frequent stops.

The Blue Ridge Parkway offers a diversity of recreational activities for people with a wide range of interests, physical abilities, and time available. Popular activities for vehicle-based visitors include sightseeing, picnicking, viewing wildflowers and fall color, photography, hiking, bird watching, and Ranger guided programs. It is also possible to rock climb, hang glide, fish for trout, and bicycle. Camping is also allowed at designated sites.

There have been over 20 million visitors to the Blue Ridge Parkway every year since 1997 (NPS, 2005b). As the Parkway is 469 miles long, not all visitors travel the entire length of the Parkway. According to a recent survey of visitors to the Parkway (Valliere et. al, 2002), the most popular activities reported were scenic driving/ stopping at overlooks (88.1%), visiting visitor centers (60.5%), hiking (59.0%), picnicking (39%), purchasing something at visitor center stores (37.2%), and visiting historic sites (33.7%).

In 2005 there were approximately 570,000 vehicles that are estimated to have passed MP 270.3 (adding numbers from the nearest traffic counters MP 270 at SR 421 to the south and SR 16 to the north). The project area is not in a commuter zone and there is never any traffic congestion (Hultquist, 2006).

The Blue Ridge Parkway draft Vista Management Plan describes that the Lewis Fork Overlook has a view toward farm land spread out over the Piedmont valley. It looks over several farms in a distant view of this valley with panoramic mountains views in the far background. Views to the Piedmont Valley are considered very picturesque. This view has a moderate rating compared to other Piedmont valley views in the Doughton Park and Plateau Districts. Betsey's Rock Falls Overlook to the north at MP 267.7 has a more wide open and more highly rated view to Piedmont valley, within Wilkes County. Similarly, Cascades Falls Overlook to the south at MP 272 has a more wide open and highly rated view to Piedmont Valley than the Lewis Fork Overlook. Within 4.7 miles of Lewis Fork Overlook there are approximately 10 vista cuts on Parkway left looking toward Wilkes County and the Piedmont Valley. The Lewis Fork Overlook has a narrower perspective and is more highly screened with tree growth than the other two overlooks. Many of the vista cuts along the Parkway motor road to the north and south of Lewis Fork Overlook are similarly being screened from view with large tree growth.

Methodology

Public scoping input and observation of visitation patterns, combined with assessment of what is available to visitors under current management, were used to estimate the effects of the actions in the various alternatives in this EA. The impact on the ability of the visitor to experience a full range of park resources was analyzed by examining resources and objectives presented in the park significance statement.

The thresholds of change for the intensity of an impact on visitor use and experience are defined as follows:

Negligible: Changes in visitor use and/or experience, including changes in recreation and visual resources, would be below or at the level of detection. The visitor would not likely be aware of the effects associated with the alternative.

Minor: Changes in visitor use and/or experience, including changes in recreation and visual resources, would be detectable, although the changes would be slight. The visitor would be aware of the effects associated with the alternative, but the effects would be slight.

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

Major: Changes in visitor use and/or experience, including changes in recreation and visual resources, would be readily apparent and severely adverse or exceptionally beneficial. The visitor would be aware of the effects associated with the alternative and would likely express a strong opinion about the changes.

The thresholds of change for the duration of an impact on visitor use and experience are defined as follows:

Short-term: Occurs only during project implementation activities.
Long-term: Extend beyond project implementation activities.

Impacts of the No Action Alternative

Impacts Analysis
The No Action Alternative would maintain conditions in their present state. Although the visitor experience would not change from current conditions, visitor complaints of near accidents, or actual accidents, would go on as the underlying slope and fill materials continue to move and road surfaces deteriorate. While there would be no disturbances to traffic flow during construction or changes in visual resources, there would also be no long-term road improvements. Continued cyclic maintenance of the road at MP 270.3 may cause some short-term impacts on visitor experience if traffic is periodically slowed down to accommodate the repairs. As there would be no major new road repairs, visitors would not be aware of the effects associated with this alternative, specifically deteriorating road conditions which may impact driving conditions.

Cumulative Effects
Two future projects to repair and resurface nearby road sections and another to repair the nearby Goshen Creek Bridge are planned for FY 2007 through FY 2011. One road repair project is a FY 2009-2010 project and would not likely require a detour. The other is a FY 2010-2011 project with no road closures anticipated. The Goshen Creek Bridge repair is a FY 2007 project that would likely require road closure. These projects would contribute adverse cumulative impacts on the visitor experience as visitors would be required to wait in traffic at construction sites or go out of their way to use detours. The Developed Area Management Plan for the Cone Estate could identify additional visitor uses and construction of new facilities that could also affect visitor use and experience by increasing traffic along the Parkway as more visitors may visit the estate. As there would not be any major new road repairs under the No Action Alternative, other than cyclic maintenance, this alternative would contribute negligible, adverse impacts on visitor use and experience.

Conclusion
Alternative A would result in short-term, negligible, direct adverse impacts on visitor use and experience due to inconvenience from continuing cyclic maintenance of deteriorating road conditions. Alternative A would contribute negligible, adverse cumulative impacts to visitor use and experience.

Impacts of Alternative B (Anchor Blocks)

Impacts Analysis
Alternative B would occur over a period of seven months between November 1 and June 1. The Parkway at the project site would be closed, with a detour, during the winter months (November 1 thru April 15), consequently expediting the work. From April 15 until project completion (less than 2 months), construction would require a single lane closure of the Parkway. Complete Parkway closure would be required daily for ½ -1 hour to transport anchor blocks from storage to the slope location where they would be installed. Short-term traffic delays and detours would have adverse impacts on the visitor experience for one peak visitor season as people would be inconvenienced by the change in route, extra time it would take to follow the detour, or time spent in traffic. Visitors in approximately 570,000 vehicles could be impacted (approximately 3% of Parkway visitation). However, the altered traffic patterns would be temporary during construction and visitors would be provided with a means of accessing their planned destinations.

Road closure would affect recreational use of the adjoining Lewis Fork Overlook for scenic viewing as it would not be accessible to visitors during that period. However, visitors would have ample opportunity to view the Piedmont valley from numerous vistas to the north and south of the project site. The six vista cuts along the motor road to the north and south of Lewis Fork Overlook would be considered sufficient to provide repetitive views of the same valley and mountain views within the area. The Lewis Fork Overlook provides the lowest rated and least open views to the Piedmont Valley than do the overlooks to the north and south, which are approximately 2 miles in distance.

Forest cutting may be deep enough into forest growth to open and widen the vista cut to the south of the Lewis Fork Overlook, thus widening and opening the view to the Piedmont Valley from the overlook. However, the view would likely be screened by large tree growth at the toe of the vista cut. Widening the view in this location would only provide a similar experience to the viewing opportunity at the overlooks located to the north and south of the Lewis Fork Overlook. Additional or a widened vista cuts along the motor road would not be valued in the area and the cost to maintain existing vista cuts is already prohibitively high. Reforestation measures to adequately prevent erosion over the anchor block system on Parkway left would only provide a temporary vista opening. Because the anchor block system would be covered with soils and forest when completed, there is no visual impact created from an additional Parkway structure as in the case of the bridge installation.

The sight of construction activities and the clearing of trees and vegetation from the embankment slope would reduce the sense of naturalness in the area and thus may detract from visitor enjoyment as visual resources would be impacted in the short-term. However, the anchor block system would be completely buried once construction was completed, and therefore not visible. Revegetation of the site would allow the area to eventually look similar to current conditions.

Noise from traffic and construction would occur during the construction period due to the use of heavy equipment and traffic build up. These impacts would be noticeable in the area where the construction activities are occurring. Visitors driving by in their vehicles would only be subject to the noise for a short time. Visitor recreating nearby would hear the noise throughout their picnic, hike, or whatever activity

they engage in. However, these noises would be less noticeable as the distance increases from the construction site because noise decreases with distance from the source.

Cumulative Effects

Two future projects to repair and resurface nearby road sections and another to repair the nearby Goshen Creek Bridge are planned for FY 2007 through FY 2011. One road repair project is a FY 2009-2010 project and could overlap the project at MP 270.3 but would not likely require a detour. The other is a FY 2010-2011 project with no road closures anticipated and that should not overlap the MP 270.3 project time schedule. The Goshen Creek Bridge repair is a FY 2007 project that would likely require road closure 16 miles to the south of the MP 270.3 project with a possible schedule overlap. These projects would contribute adverse cumulative impacts on the visitor experience as visitors would be required to wait in traffic at construction sites or go out of their way to use detours. The Developed Area Management Plan for the Cone Estate could identify additional visitor uses and construction of new facilities that could also affect visitor use and experience by increasing traffic along the Parkway as more visitors may visit the estate.

If construction under Alternative B occurs at the same time as other improvements on the Parkway in the vicinity, visitors may experience exceptionally long traffic delays or multiple detours. Significant back-ups may cause impatient visitors to travel to nearby recreation areas. Additionally, construction impacts on visual resources observed by visitors at multiple locations could also diminish the visitor experience. Overall, Alternative B would contribute minor, adverse cumulative impacts to visitor use and experience.

Conclusion

Alternative B would have short-term, minor, direct adverse impacts on visitor use and experience from noise, changes in visual resources, and inconvenience during construction. Alternative B would contribute minor, adverse cumulative impacts to visitor use and experience.

Impacts of Alternative C (Bridge with paved shoulders)

Impacts Analysis

Under Alternative C, construction would require complete closure of the road at the project site for one year, and possibly two. A Parkway detour would be in place for that time period. The detour would have adverse impacts on the visitor experience for up to two peak visitor seasons as people would be inconvenienced by the change in route and extra time it would take to follow the detour. Visitors in approximately 570,000 vehicles could be impacted (approximately 3% of Parkway visitation). However, the altered traffic patterns would be temporary during construction and visitors would be provided with a means of accessing their planned destinations.

Road closure would affect recreational use of the adjoining Lewis Fork Overlook for scenic viewing as it would not be accessible to visitors during that period. However, visitors would have ample opportunity to view the Piedmont valley from numerous vistas to the north and south of the project site. The six vista cuts along the motor road to the north and south of Lewis Fork Overlook would be considered sufficient to provide repetitive views of the same valley and mountain views within the area. The Lewis Fork Overlook provides the lowest rated and least open views to the Piedmont Valley than do the overlooks to the north and south, which are approximately 2 miles in distance.

Forest cutting due to this bridge alternative would not open views to the Piedmont valley because the forest cover is too wide in the area and the depth of cut too narrow. The bridge itself might be considered a visual impact since it introduces a structure on the Parkway that is presently not in existence in that

location. This would be true even though the bridge would be constructed very similar to other bridge structures on the Parkway.

The sight of construction activities and the clearing of trees and vegetation from the embankment slope would reduce the sense of naturalness in the area and thus may detract from visitor enjoyment as visual resources would be impacted in the short-term. In the long-term, a bridge would replace 200 linear feet of road, giving it a different appearance. Bridge engineers have been directed to design a bridge that would have minimal visual impact to the site. The proposed bridge would simulate a bridge recently constructed across SR 58 near the Meadows of Dan, on the Parkway. This alternative would carry the existing asphalt surface and roadway prism across the bridge. From the Parkway, a driver would see a masonry faced safety barrier on both sides. Most likely a driver would not realize they were on a bridge. The bridge would likely be visible from the adjacent overlook during winter, but vegetation would obscure it in the summer months.

Noise from traffic and construction would occur during the construction period due to the use of heavy equipment and traffic build up. These impacts would be noticeable in the area where the construction activities are occurring. Visitors driving by in their vehicles would only be subject to the noise for a short time. Visitor recreating nearby would hear the noise throughout their picnic, hike, or whatever activity they engage in. However, these noises would be less noticeable as the distance increases from the construction site because noise decreases with distance from the source.

Cumulative Effects

Two future projects to repair and resurface nearby road sections and another to repair the nearby Goshen Creek Bridge are planned for FY 2007 through FY 2011. One road repair project is a FY 2009-2010 project and could overlap the project at MP 270.3 but would not likely require a detour. The other is a FY 2010-2011 project with no road closures anticipated and that should not overlap the MP 270.3 project time schedule. The Goshen Creek Bridge repair is a FY 2007 project that would likely require road closure 16 miles to the south of the MP 270.3 project with a possible schedule overlap. These projects would contribute adverse cumulative impacts on the visitor experience as visitors would be required to wait in traffic at construction sites or go out of their way to use detours. The Developed Area Management Plan for the Cone Estate could identify additional visitor uses and construction of new facilities that could also affect visitor use and experience by increasing traffic along the Parkway as more visitors may visit the estate.

If construction under Alternative C occurs at the same time as other improvements on the Parkway in the vicinity, visitors may experience exceptionally long traffic delays or multiple detours. Significant back-ups may cause impatient visitors to travel to nearby recreation areas. Additionally, construction impacts on visual resources observed by visitors at multiple locations could also diminish the visitor experience. Overall, Alternative C would contribute minor, adverse cumulative impacts to visitor use and experience.

Conclusion

Alternative C would have short-term, moderate, direct adverse impacts on visitor use and experience from road closure during construction for up to two peak tourist seasons and long-term, negligible, adverse impacts due to visual changes in road configuration. Alternative C would contribute minor, adverse cumulative impacts to visitor use and experience.

Impacts of Alternative D (Bridge with grassy shoulders)

Impacts Analysis

Under Alternative D, construction would require complete closure of the road at the project site for one year, and possibly two. A Parkway detour would be in place for that time period. The detour would have adverse impacts on the visitor experience for up to two peak visitor seasons as people would be inconvenienced by the change in route and extra time it would take to follow the detour. Visitors in approximately 570,000 vehicles could be impacted (approximately 3% of Parkway visitation). However, the altered traffic patterns would be temporary during construction and visitors would be provided with a means of accessing their planned destinations.

Road closure would affect recreational use of the adjoining Lewis Fork Overlook for scenic viewing as it would not be accessible to visitors during that period. However, visitors would have ample opportunity to view the Piedmont valley from numerous vistas to the north and south of the project site. The six vista cuts along the motor road to the north and south of Lewis Fork Overlook would be considered sufficient to provide repetitive views of the same valley and mountain views within the area. The Lewis Fork Overlook provides the lowest rated and least open views to the Piedmont Valley than do the overlooks to the north and south, which are approximately 2 miles in distance.

Forest cutting due to this bridge alternative would not open views to the Piedmont valley because the forest cover is too wide in the area and the depth of cut too narrow. The bridge itself might be considered a visual impact since it introduces a structure on the Parkway that is presently not in existence in that location. This would be true even though the bridge would be constructed very similar to other bridge structures on the Parkway.

The sight of construction activities and the clearing of trees and vegetation from the embankment slope would reduce the sense of naturalness in the area and thus may detract from visitor enjoyment as visual resources would be impacted in the short-term. In the long-term, a bridge would replace 200 linear feet of road, giving it a different appearance. Bridge engineers have been directed to design a bridge that would have minimal visual impact to the site. The proposed bridge would simulate a bridge recently constructed across SR 58 near the Meadows of Dan, on the Parkway. This alternative would carry the existing asphalt surface, grassy shoulders, and roadway prism across the bridge. From the Parkway, a driver would see a masonry faced safety barrier on both sides. Most likely a driver would not realize they were on a bridge. The bridge would likely be visible from the adjacent overlook during winter, but vegetation would obscure it in the summer months.

Noise from traffic and construction would occur during the construction period due to the use of heavy equipment and traffic build up. These impacts would be noticeable in the area where the construction activities are occurring. Visitors driving by in their vehicles would only be subject to the noise for a short time. Visitor recreating nearby would hear the noise throughout their picnic, hike, or whatever activity they engage in. However, these noises would be less noticeable as the distance increases from the construction site because noise decreases with distance from the source.

Cumulative Effects

Two future projects to repair and resurface nearby road sections and another to repair the nearby Goshen Creek Bridge are planned for FY 2007 through FY 2011. One road repair project is a FY 2009-2010 project and could overlap the project at MP 270.3 but would not likely require a detour. The other is a FY 2010-2011 project with no road closures anticipated and that should not overlap the MP 270.3 project time schedule. The Goshen Creek Bridge repair is a FY 2007 project that would likely require road closure 16 miles to the south of the MP 270.3 project with a possible schedule overlap. These projects

would contribute adverse cumulative impacts on the visitor experience as visitors would be required to wait in traffic at construction sites or go out of their way to use detours. The Developed Area Management Plan for the Cone Estate could identify additional visitor uses and construction of new facilities that could also affect visitor use and experience by increasing traffic along the Parkway as more visitors may visit the estate.

If construction under Alternative D occurs at the same time as other improvements on the Parkway in the vicinity, visitors may experience exceptionally long traffic delays or multiple detours. Significant back-ups may cause impatient visitors to travel to nearby recreation areas. Additionally, construction impacts on visual resources observed by visitors at multiple locations could also diminish the visitor experience. Overall, Alternative D would contribute minor, adverse cumulative impacts to visitor use and experience.

Conclusion
Alternative D would have short-term, moderate, direct adverse impacts on visitor use and experience from road closure during construction for up to two peak tourist seasons and long-term, negligible, adverse impacts due to visual changes in road configuration. Alternative D would contribute minor, adverse cumulative impacts to visitor use and experience.

CULTURAL LANDSCAPES

Affected Environment

The cultural landscape of the Blue Ridge Parkway incorporates both cultural and natural elements. The cultural elements include the roadway and the historic buildings and structures along its path which were constructed in a similar "rustic style", with native stone facades. These stone facades enable the roadway structures to blend in with the natural environment. The natural elements include intact vegetation and scenic vistas in the original rural settings. Although a cultural landscape inventory has not been conducted, it is clear that the Blue Ridge Parkway constitutes a cultural landscape of which the roadway and the historic buildings and structures are the dominating cultural features.

Principal Parkway motor road designed landscape components include shoulders, paved waterways, constructed landforms, guardrails, guardwalls, bridges, culverts and tunnels. Design standards adopted for these components was a compromise between the highway engineers' desire to meet modern highway standards for grade, curvature and safety and the landscape architects' attempt to best unify the road and landscape in a way that minimized construction scarring on the mountainside and provided a type of parkway with its own distinctive character.

A draft Historic Resource Study (Firth, 2005) was commissioned to evaluate the eligibility of the Parkway for nomination as a National Historic Landmark (NHL). The purpose of the study was to evaluate the historical significance of the Blue Ridge Parkway, to identify the resources that contribute to that significance, and to provide guidance on the preservation of those resources. Firth (2005) describes the Blue Ridge Parkway as the first long-distance, scenic national parkway being not only a new type of parkway, but also a new type of national park, one that was designed around the theme of recreational motoring.

The Parkway was designed based on the adoption of three design principles: first, the preeminent importance of scenery; second, the necessity of providing a safe and enjoyable experience for the recreational motorist; and third, the importance of protecting the natural environment and gently fitting the road and all other structures into their mountain setting so that they look as though they belong there.

The design characteristics of the main components of the Parkway according to Firth (2005):

- This is a mountain road but its location changes every few miles along the 469-mile route, in order to avoid monotony and to capitalize fully on the scenic potential of the region.
- The road has a curvilinear alignment that appears to glide across the natural contours and fit smoothly into the topography of the mountain slopes.
- The road is designed for a low driving speed, and there are frequent overlooks to allow the safe enjoyment of scenery.
- Road structures are designed to fit the road to the topography, and are located and constructed in ways that minimize the scarring of the mountain slopes.
- Most designs are guided by a rustic architectural aesthetic that places great emphasis on fitting each structure into its landscape setting and features the use of native materials, particularly stone; however some designs are guided by a modern aesthetic expressed in steel and concrete, but, nonetheless, are carefully fitted into their settings.

The draft Historic Resource Study (Firth, 2005) recommends that the Parkway be nominated as a National Historic Landmark (NHL). It meets two of the NHL criteria (one and four) for national significance and possesses the extraordinary national importance and high degree of integrity required for landmark status. Criteria One includes properties that are associated with events that have made a substantial contribution to and are identified with, or that outstandingly represent the broad national patterns of United States history and from which an understanding and appreciation of those broad patterns may be gained (NPS, no date-b). Criteria Four includes properties that embody the distinguishing characteristics of an architectural type or specimen exceptionally valuable for the study of a period, style, or method of construction, or that represent an important, distinctive, and exceptional entity whose components may lack individual distinction.

Methodology

The impact analysis examines the potential effects on Parkway eligibility for designation as a National Historic Landmark as a result of project implementation. NHL criteria were used to estimate the effects of the actions in the various alternatives in this EA.

The thresholds of change for the intensity of an impact on cultural landscapes are defined as follows:

Negligible: The effect is at the lowest levels of detection– barely perceptible and not measurable. For purposes of Section 106, the determination of effect would be no adverse effect.

Minor: Features or patterns of the cultural landscape would be altered, but would not diminish the overall integrity of the landscape; for purposes of Section 106, the determination of effect would be no adverse effect.

Moderate: Features or patterns of the cultural landscape would be altered, diminishing the overall integrity of the landscape; for purposes of Section 106, the determination of effect would be adverse.

Major: Features or patterns of the cultural landscape would be altered, diminishing the overall integrity of the landscape; for purposes of Section106, the determination of effect would be adverse.

The thresholds of change for the duration of an impact on cultural landscapes are defined as follows:

Short-term: Effects on the natural elements of a cultural landscape may be comparatively short-term (less than a year) until new vegetation grows or historic plantings are restored.

Long-term: Effects on the cultural landscape would persist for more than a year.

Impacts of the No Action Alternative

Impacts Analysis
As no construction activities would be conducted, no impacts on the cultural landscape would occur under Alternative A. Therefore, there would not be any impact on eligibility for NHL designation.

Cumulative Effects
Two future projects to repair and resurface nearby road sections and another to repair the nearby Goshen Creek Bridge are planned for 2007 through 2011. It is unlikely that these projects would contribute adverse cumulative impacts on the cultural landscape as they would not alter the historic character of the Parkway or the integrity of the landscape. Alternative A would not contribute to cumulative effects to the cultural landscape because no cultural resources would be impacted.

Conclusion
Alternative A would have no impacts on the cultural landscape. Alternative A would not contribute any cumulative impacts on cultural landscapes. Because there would be no major adverse impacts to a resource or value whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park; 2) key to the natural or cultural integrity of the Park or to opportunities for enjoyment of the Park; or 3) identified as a goal in the Park's GMP or other relevant NPS planning documents, there would be no impairment of the Park's resources or values with respect to cultural landscapes.

Impacts of Alternative B (Anchor Blocks)

Impacts Analysis
Under Alternative B, the road would be repaired but not be altered, and 0.78 acres at the project site would be disturbed, including vegetation removal and re-grading of the hillside below the Parkway to install anchor blocks. However, ground disturbance would be temporary and the area would be revegetated so that it would eventually look similar to its current appearance. There would not be any impact on eligibility for NHL designation as the Parkway would still meet the criteria for designation.

Cumulative Effects
Two future projects to repair and resurface nearby road sections and another to repair the nearby Goshen Creek Bridge are planned for 2007 through 2011. It is unlikely that these projects would contribute adverse cumulative impacts on the cultural landscape as they would not alter the historic character of the Parkway or the integrity of the landscape. Alternative B would contribute negligible, adverse cumulative effects to the cultural landscape due to temporary changes in landscape appearance from construction activities.

Conclusion
Alternative B would have short-term, negligible, localized direct adverse effects on the cultural landscape from vegetation removal and construction grading. Alternative B would contribute negligible, adverse cumulative impacts on the cultural landscape. Because there would be no major adverse impacts to a resource or value whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park; 2) key to the natural or cultural integrity of the Park

or to opportunities for enjoyment of the Park; or 3) identified as a goal in the Park's GMP or other relevant NPS planning documents, there would be no impairment of the Park's resources or values with respect to cultural landscapes.

Impacts of Alternative C (Bridge with paved shoulders)

Impacts Analysis

Under Alternative C, the road would be altered according to design guidelines that have been developed to meet historic design goals in construction of the bridge. The bridge would be placed in the exact footprint of the existing road. Additionally, an estimated 0.33 acres of unpaved area would be disturbed. Little to no forest area would be affected, though a few trees (.05 acres) may be removed for bridge construction. However, ground disturbance would be temporary as the area would be reseeded and it would eventually look similar to its current appearance. As there would be little to no impact on forested areas, forest revegetation should not be necessary.

There would not be any impact on eligibility for NHL designation as the Parkway would still meet the criteria for designation as the bridge would be placed in the landscape in a way that is environmentally sound and matches historic design intent. The draft NHL emphasizes landscape architecture (which highlights placement in the landscape) rather than historical structures (which highlights fabric and materials).

Cumulative Effects

Two future projects to repair and resurface nearby road sections and another to repair the nearby Goshen Creek Bridge are planned for 2007 through 2011. It is unlikely that these projects would contribute adverse cumulative impacts on the cultural landscape as they would not alter the historic character of the Parkway or the integrity of the landscape. Alternative C would contribute minor, adverse cumulative effects to the cultural landscape due to changes in road configuration, albeit they would meet historic design goals.

Conclusion

Alternative C would have short-term, negligible, localized direct adverse effects on the cultural landscape from vegetation removal and construction grading and minor, long-term, localized adverse effects from changing a section of road into a bridge. Alternative C would contribute minor, adverse cumulative impacts on the cultural landscape. Because there would be no major adverse impacts to a resource or value whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park; 2) key to the natural or cultural integrity of the Park or to opportunities for enjoyment of the Park; or 3) identified as a goal in the Park's GMP or other relevant NPS planning documents, there would be no impairment of the Park's resources or values with respect to cultural landscapes.

Impacts of Alternative D (Bridge with grassy shoulders)

Impacts Analysis

Under Alternative D, the road would be altered according to design guidelines that have been developed to meet historic design goals in construction of the bridge. The bridge would be placed in the exact footprint of the existing road. Additionally, an estimated 0.33 acres of unpaved area would be disturbed. Little to no forest area would be affected, though a few trees (.05 acres) may be removed for bridge construction. However, ground disturbance would be temporary as the area would be reseeded and it would eventually look similar to its current appearance. As there would be little to no impact on forested areas, forest revegetation should not be necessary.

There would not be any impact on eligibility for NHL designation as the Parkway would still meet the criteria for designation as the bridge would be placed in the landscape in a way that is environmentally sound and matches historic design intent. The draft NHL emphasizes landscape architecture (which highlights placement in the landscape) rather than historical structures (which highlights fabric and materials).

Cumulative Effects

Two future projects to repair and resurface nearby road sections and another to repair the nearby Goshen Creek Bridge are planned for 2007 through 2011. It is unlikely that these projects would contribute adverse cumulative impacts on the cultural landscape as they would not alter the historic character of the Parkway or the integrity of the landscape. Alternative B would contribute negligible, adverse cumulative effects to the cultural landscape due to changes in road configuration, albeit they would meet historic design goals.

Conclusion

Alternative D would have short-term, negligible, localized direct adverse effects on the cultural landscape from vegetation removal and construction grading and minor, long-term, localized adverse effects from changing a section of road into a bridge. Alternative D would contribute minor, adverse cumulative impacts on the cultural landscape. Because there would be no major adverse impacts to a resource or value whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park; 2) key to the natural or cultural integrity of the Park or to opportunities for enjoyment of the Park; or 3) identified as a goal in the Park's GMP or other relevant NPS planning documents, there would be no impairment of the Park's resources or values with respect to cultural landscapes.

HUMAN HEALTH AND SAFETY

Affected Environment

The short section of Parkway at MP 270.3 has high potential for catastrophic failure and is rated a traffic safety problem due to uneven pavement caused by continued settlement. Visitor complaints of near accidents have been received as the underlying slope and fill materials continue to move and road surfaces deteriorate.

The Parkway boundary has recently been extended from a total of 350 feet to approximately 725 feet to the nearest private land ownership boundary located directly below the slide area. With this widened boundary, impacts to bordering land are not as significant.

There is not a numerical safety rating that indicates the likelihood of failure for any of the alternatives. The safety factor used in design is not indicative of failure. Instead, this safety factor can be used to increase loads or reduce support forces to allow the design of a safe solution able to withstand all known conditions and leave allowance for unknowns and variations. Although a numerical value cannot be assigned to the risk for the various options, a comparative analysis of risk using engineering judgment is as follows (FHWA, 2006):

No Action – High risk to slope, high risk to Parkway

Anchor Blocks – Very low risk to slope, very low risk to Parkway

Bridges – Low risk to slope, very low risk to Parkway

Methodology

Existing and potential threats to human health and safety within the project area were identified with the help of NPS staff and evaluated in the impact analysis. The potential for project implementation to worsen or improve existing threats, or to create new threats, to human health and safety was evaluated.

The thresholds of change for the intensity of an impact on human health and safety are defined as follows:

Negligible: Human health and safety would not be affected, or the effects would be at the lowest levels of detection and would not have an appreciable effect on human health and safety.

Minor: The effect would be detectable but would not have an appreciable effect on human health and safety. If mitigation were needed, it would be relatively simple and would likely be successful.

Moderate: The effects would be readily apparent and result in substantial, noticeable effects to human health and safety on a local scale. Mitigation measures would probably be necessary and would likely be successful.

Major: The effects would be readily apparent and result in substantial, noticeable effects to human health and safety on a regional scale. Extensive mitigation measures would be needed, and success would not be guaranteed.

The thresholds of change for the duration of an impact on human health and safety are defined as follows:

Short-term: Effects last one year or less.
Long-term: Effects last longer than one year.

Impacts of the No Action Alternative

Impacts Analysis
Under the No Action Alternative, safety hazards would remain along the road. Visitors who drive the section of road at MP 270.3 would continue to be at risk for auto accidents due to uneven road surfaces. Additionally, risk of slope failure and safety of the Parkway visitor would be considerable over the long-term. Cyclic maintenance of the road would continue to provide temporary fixes which may put off accidents, but would not eliminate the safety hazards. There would be high risk to the slope and high risk to the Parkway if the existing untreated slope is left as is.

Cumulative Effects
Routine maintenance and interim road repairs may reduce safety risks in the short-term. In the long-term, road conditions could continue to deteriorate or the slope may fail altogether. Two future projects to repair and resurface nearby road sections and another to repair the nearby Goshen Creek Bridge are planned for 2007 through 2011. These projects would contribute beneficial cumulative impacts on human health and safety as the repairs would likely eliminate any associated safety hazards. The Developed Area Management Plan for the Cone Estate could identify additional visitor uses and construction of new facilities that could also affect visitor use and experience by increasing traffic along the Parkway as more visitors may visit the estate, leading to an increased probability of motor vehicle accidents. Given the

continuing hazards of the No Action, Alternative A would contribute moderate, adverse cumulative impacts on human health and safety on the Parkway.

Conclusion
Alternative A would have long-term, moderate, direct adverse impacts on human health and safety as road hazards would continue to exist. Alternative A would contribute moderate, adverse cumulative impacts on human health and safety on the Parkway.

Impacts of Alternative B (Anchor Blocks)

Impacts Analysis
Under Alternative B, anchor blocks would be installed to stabilize the existing slow moving slope at MP 270.3. This improvement would increase the safety of the road; visitors who drive the section of road at MP 270.3 would have considerably reduced risk for auto accidents from to uneven road surfaces or slope failure. Risk for this alternative is characterized as very low to the slope and very low to the Parkway.

The anchor blocks would stabilize the slide area by increasing the forces resisting the slide movement. The lower limit of the slide extent does not affect the safety factor. The current slide is occurring along a very deep, steep interface between the overburden fill soil and the bedrock because the weight of the fill exceeds the friction force between the soil and bedrock. The anchor blocks would press the fill soil against the bedrock, which increases the friction to the point where the friction would support the fill.

Although this option is expected to stabilize the slide area so no further movement would occur, if there were any continued slide movement, it would adversely affect the Parkway. Additionally, if the slope fails, it may denude some more forest area further down the slope. However, the anchor block system is expected to stabilize the entire slope and the motor road equally to the bridge alternatives, with no additional impacts to environmental resources other than during construction as previously described. The very low risk assigned to both the slope and the Parkway signifies that the risk of loss of additional forest area would also be very low, as well as very low risk to motor road failure.

Cumulative Effects
Routine maintenance and interim road repairs may reduce safety risks in the short-term. In the long-term, road conditions could continue to deteriorate or the slope may fail altogether. Two future projects to repair and resurface nearby road sections and another to repair the nearby Goshen Creek Bridge are planned for 2007 through 2011. These projects would contribute beneficial cumulative impacts on human health and safety as the repairs would likely eliminate any associated safety hazards. The Developed Area Management Plan for the Cone Estate could identify additional visitor uses and construction of new facilities that could also affect visitor use and experience by increasing traffic along the Parkway as more visitors may visit the estate, leading to an increased probability of motor vehicle accidents. Along with these other repair projects, implementation of an anchor block system to stabilize the slope under Alternative B would contribute minor, beneficial cumulative impacts to human health and safety in the park.

Conclusion
Alternative B would have long-term, moderate, direct beneficial impacts on human health and safety due to the stabilization of the moving slope and roadway. Alternative B would contribute minor, beneficial cumulative impacts to human health and safety.

Impacts of Alternative C (Bridge with paved shoulders)

Impacts Analysis
Under Alternative C, a bridge with paved shoulders would be constructed to stabilize the road at MP 270.3. The bridge would protect the Parkway by spanning over the active slide. This improvement would increase the safety of the road; visitors who drive the section of road at MP 270.3 would have considerably reduced risk for auto accidents from to uneven road surfaces or slope failure. Risk for this alternative is characterized as low to the slope and very low to the Parkway.

This alternative highly stabilizes the motor road from failure by installing a bridge but does not insure the slope itself would not fail and move beneath the bridge. If the slope fails, the bridge (footings would be anchored to bedrock and designed for lateral movement) and the motor road would remain stable since the bridge would be designed not to move or to fail in the event of slope failure.

Although material would be removed from the top of the slide area and lessen the load driving the slide, this alternative does not stabilize the slide area and the slide may continue to move. If the slope fails, it may denude some more forest area further down the slope. However, the low risk assigned to the slope indicates that the risk of loss of additional forest area would also be low, without any additional impacts to environmental resources other than during construction as previously described.

Cumulative Effects
Routine maintenance and interim road repairs may reduce safety risks in the short-term. In the long-term, road conditions could continue to deteriorate or the slope may fail altogether. Two future projects to repair and resurface nearby road sections and another to repair the nearby Goshen Creek Bridge are planned for 2007 through 2011. These projects would contribute beneficial cumulative impacts on human health and safety as the repairs would likely eliminate any associated safety hazards. The Developed Area Management Plan for the Cone Estate could identify additional visitor uses and construction of new facilities that could also affect visitor use and experience by increasing traffic along the Parkway as more visitors may visit the estate, leading to an increased probability of motor vehicle accidents. Along with these other repair projects, implementation of an anchor block system to stabilize the slope under Alternative C would contribute moderate, beneficial cumulative impacts to human health and safety in the park.

Conclusion
Alternative C would have long-term, minor to moderate, direct beneficial impacts on human health and safety due to the stabilization of the roadway. Alternative C would contribute minor, beneficial cumulative impacts to human health and safety.

Impacts of Alternative D (Bridge with grassy shoulders)

Impacts Analysis
Under Alternative D, a bridge with grassy shoulders would be constructed to stabilize the road at MP 270.3. The bridge would protect the Parkway by spanning over the active slide. This improvement would increase the safety of the road; visitors who drive the section of road at MP 270.3 would have considerably reduced risk for auto accidents from to uneven road surfaces or slope failure. Risk for this alternative is characterized as low to the slope and very low to the Parkway.

This alternative highly stabilizes the motor road from failure by installing a bridge but does not insure the slope itself would not fail and move beneath the bridge. If the slope fails, the bridge (footings would be

anchored to bedrock and designed for lateral movement) and the motor road would remain stable since the bridge would be designed not to move or to fail in the event of slope failure.

Although material would be removed from the top of the slide area and lessen the load driving the slide, this alternative does not stabilize the slide area and the slide may continue to move. If the slope fails, it may denude some more forest area further down the slope. However, the low risk assigned to the slope indicates that the risk of loss of additional forest area would also be low, without any additional impacts to environmental resources other than during construction as previously described.

Cumulative Effects

Routine maintenance and interim road repairs may reduce safety risks in the short-term. In the long-term, road conditions could continue to deteriorate or the slope may fail altogether. Two future projects to repair and resurface nearby road sections and another to repair the nearby Goshen Creek Bridge are planned for 2007 through 2011. These projects would contribute beneficial cumulative impacts on human health and safety as the repairs would likely eliminate any associated safety hazards. The Developed Area Management Plan for the Cone Estate could identify additional visitor uses and construction of new facilities that could also affect visitor use and experience by increasing traffic along the Parkway as more visitors may visit the estate, leading to an increased probability of motor vehicle accidents. Along with these other repair projects, implementation of an anchor block system to stabilize the slope under Alternative D would contribute moderate, beneficial cumulative impacts to human health and safety in the park.

Conclusion

Alternative D would have long-term, minor to moderate, direct beneficial impacts on human health and safety due to the stabilization of the roadway. Alternative D would contribute minor, beneficial cumulative impacts to human health and safety.

CONSULTATION AND COORDINATION

PUBLIC INVOLVEMENT

The purpose of the scoping process, as outlined in CEQ's regulations for implementing NEPA (40 CFR 1501.7), is to determine the scope of issues to be addressed in the EA and to identify significant issues relating to the Proposed Action. The lead agency is required to invite input from Federal, State, and local agencies, affected Native American tribes, project proponents, and other interested parties (Section 1501.7 (a)(1)). To satisfy scoping requirements for this project, scoping letters were mailed out requesting public and agency input on issues to be addressed in the EA. Table A-1 in Appendix A lists all persons, agencies/organizations to whom the scoping letters were sent. The scoping letter is presented as Figure A-1, a scoping brochure as Figure A-2, and the news release that announces that the Parkway was seeking public input as Figure A-3.

The public scoping period for the project began on June 1, 2006 and ended on July 3, 2006. Only one comment was received from the public during this period. The NPS also underwent consultations with several State and Federal agencies regarding the project. These consultation letters are presented in Figures A-4 through A-7 in Appendix A.

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APPENDIX A: PUBLIC SCOPING AND AGENCY COORDINATION

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Figure A-1. Scoping Letter

United States Department of the Interior

National Park Service
Blue Ridge Parkway
199 Hemphill Knob Road
Asheville, North Carolina 28803

IN REPLY REFER TO:

L7617
PIN 10058

June 1, 2006

Dear Interested Party:

Pursuant to the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality (CEQ) NEPA regulations (40 Code of Federal Regulations (CFR) 1500 to 1508), and the National Park Service (NPS) NEPA compliance guidelines (DO-12), the NPS has decided to prepare an Environmental Assessment (EA) to repair approximately 200 linear feet of unstable roadbed on the Blue Ridge Parkway at Milepost 270.3, Section 2E, in Wilkes County, North Carolina. Proposed alternatives include spanning the unstable area by either construction of a bridge on the Parkway or retaining the area with an anchor block system. The anchor block system would be installed on slopes below the Parkway and would include installation of additional subsurface drainage beneath Parkway fill colluvium and pavement.

Project Background

The roadbed movement at Milepost 270.3 has been active since the spring of 1975. This section of Parkway has high potential for catastrophic failure and is rated a traffic safety problem due to uneven pavement caused by continued settlement. Visitor complaints of near accidents have been received as the underlying slope and fill materials continue to move and road surfaces deteriorate. As a result this area is considered an extremely high priority. Because attempts to arrest this movement have proven to be ineffective, more advanced geotechnical repair solutions must be considered.

A horizontal subsurface drainage system was installed in the late 1970's and twice in the 1980's to remove subsurface drainage beneath fill soils believed to be the main cause of the movement. The pavement has been patched and reconstructed numerous times to remove pavement dips caused by settlement, but movement and pavement settling continue.

In 1992 in another attempt to stabilize the area, a drilled shaft/horizontal drainage gallery was installed and the pavement was repaired. The system performed well for several years, but movement was reactivated in 1995 with up to five inches of settlement within a two-year period.

Two adjacent areas of roadway, approximately 85 feet apart, have been patched since 1997. An inspection of the 16 horizontal drains installed in 1992 revealed that they have been removing an average of approximately one gallon of water per minute from beneath the slide area. However, a number of trees along the lower portion of the fill slope began to lean and geotechnical monitoring of the area indicate continual slope movement and the slope is considered highly potential for catastrophic failure. Recent

geotechnical testing and analysis reveal that roadway movement is most likely caused by water movement between fill colluviums deposits and residual soils. Because past attempts to arrest the movement have proven to be ineffective, more advanced geotechnical repair solutions must be proposed.

Project Alternatives

Four alternatives for the proposed project are currently being considered by BLRI. These include:

1. Alternative A (No Action): Leave the unstable roadway as is.
2. Alternative B (Anchor Blocks): The slope would be stabilized using concrete anchor blocks with tendons anchored to rock beneath the slip plane.
3. Alternative C (Bridge with paved shoulders): Construct a bridge to span the unstable area. Some of the material from the site would be removed when placing the bridge and the existing roadway in this section would be obliterated. Bridge shoulders would be paved.
4. Alternative D (Bridge with grass shoulders): Construct a bridge to span the unstable area. Some of the material from the site would be removed when placing the bridge and the existing roadway in this section would be obliterated. Bridge shoulders would be grass.

The EA will analyze alternatives and the resulting decision will establish the repair solution for this unstable roadbed. Please identify any resources within your purview that may experience potential impacts from this project and list specific mitigation measures. Please provide your written comments by July 3, 2006 to:

Blue Ridge Parkway
Attn: Suzette Molling
199 Hemphill Knob Road
Asheville, North Carolina 28803

If you have any concerns or questions, please contact Suzette Molling, Environmental Protection Specialist, at 828-271-4779 ext. 219 (Asheville, N.C.).

We welcome your involvement and encourage your input into this proposal.

Sincerely,

/signed/

Philip A. Francis, Jr.
Superintendent

cc: Eveline Martin, MANGI

SMolling: sm: 5-31-06
(NEPA/EA/PIN 10058/Scoping/PIN 10058-Agency Scoping Ltr.doc)

Figure A-2. Scoping Brochure

Blue Ridge Parkway

National Park Service
U.S. Department of the Interior

Project Scoping

June 2006

Environmental Assessment (EA) for Repair of Unstable Roadbed on the Blue Ridge Parkway at MP 270.3

The roadbed movement at Milepost 270.3 in Wilkes County, North Carolina has been active since the spring of 1975. This approximately 200 linear foot section of Parkway has high potential for catastrophic failure and is rated a traffic safety problem due to uneven pavement caused by continued settlement. Visitor complaints of near accidents have been received as the underlying slope and fill materials continue to move and road surfaces deteriorate. As a result this area is considered an extremely high priority. Because attempts to arrest this movement have proven to be ineffective, more advanced geotechnical repair solutions must be considered.

The National Park Service (NPS) is presently conducting an Environmental Assessment (EA) for this project. Proposed alternatives include spanning the unstable site by either construction of a bridge on the Parkway or stabilizing the section with an anchor block system. The purpose of the analysis is twofold: 1) carry out compliance responsibilities under various statutes including the National Environmental Policy Act, and 2) investigate the potential for effects on any environmental resources resulting from this proposal.

As the Superintendent of the Blue Ridge Parkway, I invite you to participate in this scoping process.

Sincerely,

Philip A. Francis, Jr.

Overview of the Process

Project milestones include:

- Public scoping period (closes July 3, 2006)
- Preparation of Environmental Assessment (EA)
- Public review of environmental assessment
- Analysis of public comment
- Preparation of decision document
- Announcement of decision

Resources and Concerns

Initial internal project scoping identified the following resources and other concerns for consideration in the EA:

Geological Resources
Soundscape
Wildlife
Human Health & Safety
Vegetation
Cultural Resources
Recreational Resources
Threatened & Endangered Species

What does the scoping period mean?
Scoping is done in the initial phase of a project to seek input from a variety of sources. The input is used to identify issues, areas requiring additional study, and topics that will be analyzed in the EA process. This is an opportunity for you to provide us with your suggestions, comments, and concerns regarding this proposed project for the Blue Ridge Parkway.

Is scoping my only opportunity to comment on the project?
No, once the EA is developed, the document will be made available for public review for a 30-day period.

Alternatives

The preliminary alternatives to be evaluated in the environmental assessment are:

1) Alternative A (No Action): Leave the unstable roadway as is.
2) Alternative B (Anchor Blocks): The slope would be stabilized using concrete anchor blocks with tendons anchored to rock beneath the slip plane.
3) Alternative C (Bridge with paved shoulders): Construct a bridge to span the unstable area. Some of the material from the site would be removed when placing the bridge and the existing roadway in this section would be obliterated. Bridge shoulders would be paved.
4) Alternative D (Bridge with grass shoulders): Construct a bridge to span the unstable area. Some of the material from the slide would be removed when placing the bridge and the existing roadway in this section would be obliterated. Bridge shoulders would be grass.

Please let us know by July 3, 2006:

1. Do you have any ideas to share about issues/concerns, or are there any issues/concerns about the project that you think we should consider?

2. Are there any other alternatives that you think should be considered?

3. Do you have other comments and suggestions for us to consider in the environmental assessment?

We want to hear from you so that we can make the most informed decisions concerning the alternatives on this project. We appreciate your input into this process and would like your feedback by *July 3, 2006*. You are welcome to write to us at the address below, but our preference would be for you to provide your comments on the National Park Service Planning, Environment & Public Comment (PEPC) web site. Comments can be made directly online by going to the following link: *http://parkplanning.nps.gov/projectHome.cfm?projectId=10058*.

Written comments may also be submitted to:

Blue Ridge Parkway
Attn: Suzette Molling
199 Hemphill Knob Road
Asheville, North Carolina 28803-8686

If you wish to be added to the park's mailing list for this and other announcements, please be sure to indicate that in PEPC or in your response.

It is the practice of the NPS to make all comments, including the names and addresses of respondents who provide the comments, available for public review following the conclusion of the scoping process. Individuals may request that the NPS withhold their name and/or address from public disclosure. If you wish to do this, you must state this prominently at the beginning of your comment. Commentators using the PEPC website can make such a request by checking the box "keep my contact information private." The NPS will honor such requests to the extent allowable by law, but you should be aware that the NPS may still be required to disclose your name and address pursuant to the Freedom of Information Act.

Figure A-3. News Release

National Park Service
U.S. Department of the Interior

Blue Ridge Parkway
www.nps.gov/blri

199 Hemphill Knob Road
Asheville, NC 28803

Blue Ridge Parkway News Release

June 1, 2006

For Immediate Release

Contact: Suzette Molling (828) 271-4779 ext. 219; email Suzette_Molling@nps.gov
or Larry Hultquist (828) 271-4779 ext. 247; email Larry_Hultquist@nps.gov

Par**kway Seeks Input for Road Repair Near West Jefferson**

(Asheville)—The Blue Ridge Parkway is seeking public input, through July 3, to identify issues and additional study that will be needed to develop an Environmental Assessment for the repair of a short road section that is near West Jefferson.

Parkway officials said that the roadbed and supporting slope for a 200' section of the motor road at Milepost 270.3 are unstable and may need to be reengineered. Efforts to repair the road have been made intermittently for more than 30 years. None has proven effective, and it may be necessary to stabilize the section by using an anchor and block system or by constructing a short bridge.

The project scoping phase, now underway, is the initial step in the development of an Environmental Assessment that will analyze alternatives and their potential impacts.

For more information and to comment on this project, visit the National Park Service website: http://parkplanning.nps.gov. Select Blue Ridge Parkway from the park dropdown menu and then click on project title "EA Scoping to Repair Unstable Roadbed at MP 270.3." Information is also available, and comments may be made by writing to: Blue Ridge Parkway, ATTN: Suzette Molling, 199 Hemphill Knob Road, Asheville, NC 28803. Comments must be postmarked by July 3.

Comments are typically treated as a public record and made available for public review. Individuals may request that the National Park Service withhold their name and address from disclosure. Such requests will be honored to the extent allowable by law.

###

Table A-1. Persons Who Received the Scoping Letter		
Mr. John Thomas US Army Corps of Engineers Raleigh Regulatory Field Office 6508 Falls of the Neuse Road, Suite 120 Raleigh, North Carolina 27615	Mr. Ronald C. Howard District Conservationist USDA Natural Resources Conservation Service Wilkesboro Service Center Post Office Box 194 Wilkesboro, North Carolina 28697-0194	Mr. Brian P. Cole, Supervisor U.S. Fish and Wildlife Service Asheville Field Office 160 Zillicoa Street Asheville, North Carolina 28801
Ms. Mari Sue Hilliard Forest Supervisor National Forests in North Carolina 160A Zillicoa Street Asheville, North Carolina 28801	Mr. Allen Ratzlaff Fish and Wildlife Service Asheville Field Office 160 Zillicoa Street Asheville, North Carolina 28801	Mr. Dave McHenry Mountain Region Reviewer Habitat Conservation Program North Carolina Wildlife Resources Commission 20830 Great Smoky Mountain Exp Waynesville, North Carolina 28786
Mr. Jeffrey H. Schwierjohann Mountain Region Wildlife Diversity Program Supervisor North Carolina Wildlife Resources Commission 271 Morgan Branch Road Leicester, North Carolina 28748	Mr. Curtis Smalling Audubon North Carolina Mountain Office 667 George Moretz Lane Boone, North Carolina 28607	Ms. Chrys Baggett Environmental Policy Act Coordinator State Clearinghouse 1301 Mail Service Center Raleigh, North Carolina 27699-1301
Mr. David Brook, Deputy State Historic Preservation Office 4617 Mail Service Center Raleigh, NC 27699-4617	Dr. Jeffrey J. Crow SHPO Division of Archives & History 4610 Mail Service Center Raleigh, NC 27699-4610	Ms. Renee Gledhill-Earley Environmental Review Coordinator NC Dept. of Cultural Resources 109 East Jones Street Raleigh, NC 27601-2807
Ms. Nann Guthrie Senior Field Officer, Western Region NC Department of Environment, Health & Natural Resources 59 Woodfin Place Asheville, North Carolina 28801	Ms. Linda Pearsall North Carolina Natural Heritage Program Post Office Box 27687 Raleigh, North Carolina 27699- 1615	Mr. Joe Mickey NC Wildlife Resources Commission 155 Timberbrook Trail State Road, North Carolina 28676
Mr. Ron Holland Regional Supervisor Division of Archives & History North Carolina Department of Cultural Resources 1 Village Lane, Suite 3 Asheville, North Carolina 28803	Owen Anderson Mountain Region Coordinator Habitat Conservation Program North Carolina Wildlife Resources Commission 1721 Mail Service Center Raleigh, North Carolina 27699- 1721	North Carolina Division of Environmental Management Post Office Box 29535 Raleigh, North Carolina 27605
Mr. Jim Borawa Regional Fishery Biologist North Carolina Wildlife Resource Commission 37 New Cross North Asheville, North Carolina 28805- 9213	Plant Conservation Program North Carolina Department of Agriculture Post Office Box 27647 Raleigh, North Carolina 27611- 7647	Honorable Charles Taylor District Office 22 South Pack Square Suite 330 Asheville, NC 28801
Mr. Gene Messick 541 South Hamilton Street	Mr. Dan Pittillo 675 Cane Creek Road	Johnny G. Hensley 225 White Oak Circle

Eden, North Carolina 27288	Sylva, North Carolina 28779	Burnsville, North Carolina 28714
Senator Elizabeth Dole 401 North Main Street Suite 200 Hendersonville, NC 28792	Senator Richard Burr 2000 West First Street Suite 508 Winston-Salem, NC 27104	Honorable T. Cass Ballenger District Office Post Office Box 1830 361 10th Ave. Drive, NE Hickory, NC 28603
Mr. Bob Gale, Ecologist Western North Carolina Alliance 29 North Market Street, Suite 610 Asheville, North Carolina 28801	Dr. Gary L. Walker Department of Biology Appalachian State University Rankin Science Building Boone, North Carolina 28608	Dr. Houck Medford, Executive Director Blue Ridge Parkway Foundation Post Office Box 10427 - Salem Station Winston-Salem, North Carolina 27108
Mr. Bill Thomas, Sierra Club Chairman of Public Lands in North Carolina Post Office Box 272 Cedar Mountain, North Carolina 28718	Mr. Robert D. Sutter Southeast Regional Office Nature Conservancy Post Office Box 2267 Chapel Hill, North Carolina 27515-2267	Mr. James L. Westbrook, Jr. City Manager City of Asheville Post Office Box 7148 Asheville, North Carolina 28802-7148
Mr. Andy Brown Equinox Environmental 37 Haywood Street Asheville, North Carolina 28806	Mr. Arthur Allen President, SHCG 207 River Ridge Road Asheville, North Carolina 28803	Mr. Harry N. Baldwin 501 Curtis Bridge Road Wilkesboro, North Carolina 28697
Mr. Jerry T. Lang 744 Grants Trail Centerville, OH 45459	Mr. Greg Kidd Senior Program Manager Blue Ridge Field Office National Parks Conservation Association One Page Avenue, Suite 109 Asheville, NC 28801	Ms. Brooke Struve Project Engineer Federal Highway Administration Eastern Federal Lands Highway Division 21400 Ridgetop Circle Sterling, Virginia 20166
Mr. Nicholas Finch Environmental Compliance Specialist Federal Highway Administration Eastern Federal Lands Highway Division 21400 Ridgetop Circle, Sterling, Virginia 20166	Mr. Thomas Shifflett Project Engineer Federal Highway Administration Eastern Federal Lands Highway Division 21400 Ridgetop Circle Sterling, Virginia 20166	

Figure A-4. USFS Comment Letter

USDA United States Department of Agriculture | Forest Service | National Forests in North Carolina Supervisor's Office | 160A Zillicoa Street P.O. Box 2750 Asheville, NC 28802 828-257-4200

File Code: 1910-2
Date: July 6, 2006

Ms Suzette Molling
Environmental Protection Specialist
Blue Ridge Parkway
199 Hemphill Knob Road
Asheville, NC 28803

Dear Ms Molling:

We have reviewed your request for comment on the Blue Ridge Parkway's intent to prepare an environmental assessment for the proposed repair of the Parkway at Milepost 270.3 (Your PIN 10058). We support your proposal to repair this section of roadway in order to improve public safety and reduce the potential of catastrophic failure of the fill slope.

We have no specific comments to address, but if you need any information regarding the Forest's interests, please feel free to contact Cliff Northrop, Assistant Forest Engineer, at 257-4234.

Thank you for the opportunity to comment on your proposal, and we wish you well with this repair.

Sincerely,

Monica L. Schwalbach, for

MARISUE HILLIARD
Forest Supervisor

Caring for the Land and Serving People

Printed on Recycled Paper

Figure A-5. USFWS Comment Letter

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Asheville Field Office
160 Zillicoa Street
Asheville, North Carolina 28801

June 26, 2006

Ms. Suzette Molling
Blue Ridge Parkway
199 Hemphill Knob Road
Asheville, North Carolina 28803

Dear Ms. Molling:

Subject: Proposed Repairs to about 200 Feet of Unstable Roadbed on the Blue Ridge Parkway at Milepost 270.3, Wilkes County, North Carolina

We received your letter dated June 1, 2006, in which you requested our comments on the subject project. The following comments are provided in accordance with the provisions of the Fish and Wildlife Coordination Act, as amended (16 U.S.C. 661-667e), and section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543) (Act).

According to the information provided, the National Park Service (NPS) is preparing an Environmental Assessment (EA) for the subject proposed road repairs. The project area has had chronic problems since about 1975, and multiple attempts to correct the road failure have failed.

We have no objections to the proposed project. However, as with all federal projects, we recommend that all project sites be surveyed for federally listed endangered and threatened species to ensure that these rare resources are not inadvertently lost. Enclosed is a list of federally endangered and threatened species and federal species of concern for Ashe and Wilkes Counties (the project is on the county line). In accordance with the Act, it is the responsibility of the appropriate federal agency to review its activities or programs and to identify any such activities or programs that may affect endangered or threatened species or their habitats. If it is determined that these proposed activities may adversely affect any species federally listed as endangered or threatened, formal consultation with this office must be initiated. Please note that federal species of concern are not legally protected under the Act and are not subject to any of its provisions, including section 7, unless they are formally proposed or listed as endangered or threatened. We are including these species in our response to give you advance notification and to request your assistance in protecting them.

We appreciate the opportunity to provide these scoping comments and request that you continue to keep us informed as to the progress of this proposed project. If we can be of assistance or if you have any questions, please do not hesitate to contact Mr. Allen Ratzlaff of our staff at 828/258-3939, Ext. 229. In any future correspondence concerning this project, please reference our Log Number 4-2-06-325.

Sincerely,

Brian P. Cole
Field Supervisor

cc:
Mr. David McHenry, Mountain Region Reviewer, North Carolina Wildlife Resources Commission, 20830 Great Smoky Mtn. Expressway, Waynesville, NC 28786

The U.S. Fish and Wildlife Service's (USFWS) County Species List for North Carolina

Following is a list of counties in North Carolina within which federally listed and proposed endangered, threatened, and candidate species and federal species of concern are either known or are considered probable (but not yet documented). It has been compiled by the USFWS from a variety of sources, including field surveys, museums and herbaria, literature, and personal communications.

This list contains information that is also found in the North Carolina Natural Heritage Program's (NCNHP) database of rare species information. However, the list is likely to include additional information that is not reflected in the NCNHP database.

This list is intended to assist those conducting surveys in proposed project areas, but it is not intended to serve as a substitute for field surveys. The list is subject to change as new information is received. For the most current version, please consult the website for the USFWS North Carolina Ecological Services Division at *http://nc-es.fws.gov/es/.*

Other notes:

Critical habitat is noted for the counties where it is designated or proposed. This notation is either accompanied by a description of the approximate areas affected by this designation, or a Federal Register citation where a more detailed description of the boundaries can be found.

Sea turtles our in North Carolina's coastal waters and nest along its beaches. They are listed here in the counties where they are known to nest. The USFWS has jurisdiction over sea turtles in terrestrial systems; the National Marine Fisheries Service (NMFS) has authority over sea turtles in coastal waters.

Manatees occur throughout North Carolina's coastal waters, and they are listed here in the counties where there are known concentrations of them. The USFWS has jurisdiction over manatees.

COMMON NAME	SCIENTIFIC NAME	STATUS
Ashe County		
Species		
Vertebrate		
Allegheny woodrat	*Neotoma magister*	FSC
Appalachian Bewick's wren *	*Thryomanes bewickii altus*	FSC
Appalachian cottontail	*Sylvilagus obscurus*	FSC
Bog turtle	*Clemmys muhlenbergii*	T (S/A)
Golden-winged warbler	*Vermivora chrysoptera*	FSC
Hellbender	*Cryptobranchus alleganiensis*	FSC

Kanawha minnow	*Phenacobius teretulus*	FSC
Pygmy salamander	*Desmognathus wrighti*	FSC
Red crossbill (Southern Appalachian) *	*Loxia curvirostra*	FSC
Invertebrate		
Diana fritillary (butterfly)	*Speyeria diana*	FSC
Gammon's stenelmis riffle beetle *	*Stenelmis gammoni*	FSC
Green floater	*Lasmigona subviridis*	FSC
Grizzled skipper	*Pyrgus wyandot*	FSC
Midget snaketail	*Ophiogomphus howei*	FSC
Regal fritillary (butterfly) *	*Speyeria idalia*	FSC
Vascular Plant		
Appalachian oak fern	*Gymnocarpium appalachianum*	FSC
Bog blue grass	*Poa paludigena*	FSC
Butternut	*Juglans cinerea*	FSC
Cuthbert turtlehead	*Chelone cuthbertii*	FSC
Darlington's spurge *	*Euphorbia purpurea*	FSC
Gray's lily	*Lilium grayi*	FSC
Gray's saxifrage	*Saxifraga caroliniana*	FSC
Heller's blazing star	*Liatris helleri*	T
Large-leaved Grass-of-Parnassus	*Parnassia grandifolia*	FSC
Roan mountain bluet	*Hedyotis purpurea* var. *montana*	E
Spreading avens	*Geum radiatum*	E
Swamp pink	*Helonias bullata*	T
Tall larkspur	*Delphinium exaltatum*	FSC
Torrey's Mountain-mint *	*Pycnanthemum torrei*	FSC
Virginia spiraea	*Spiraea virginiana*	T
Lichen		
Bluff mountain reindeer leichen	*Cladonia psoromica*	FSC
Rock gnome lichen	*Gymnoderma lineare*	E

Wilkes County

Species		
Vertebrate		
Bog turtle	*Clemmys muhlenbergii*	T (S/A)
Cerulean warbler	*Dendroica cerulea*	FSC
Eastern small-footed bat	*Myotis leibii*	FSC
Invertebrate		
Diana fritillary (butterfly)	*Speyeria diana*	FSC
Regal fritillary (butterfly) *	*Speyeria idalia*	FSC

Vascular Plant		
Butternut *	*Juglans cinerea*	FSC
Radford's St. John's-wort	*Hypericum* sp. 1	FSC
Torrey's Mountain-mint *	*Pycnanthemum torrei*	FSC

KEY:

Definitions of Species Status Codes:

E = endangered. A taxon "in danger of extinction throughout all or a significant portion of its range."
T = threatened. A taxon "likely to become endangered within the foreseeable future throughout all or a significant portion of its range."
C = candidate. A taxon under consideration for official listing for which there is sufficient information to support listing. (Formerly "C1" candidate species.)
FSC = federal species of concern. A a species that may or may not be listed in the future (formerly C2 candidate species or species under consideration for listing for which there is insufficient information to support listing).
T(S/A) = threatened due to similarity of appearance. A taxon that is threatened due to similarity of appearance with another listed species and is therefore listed for its protection. Taxa listed as T(S/A) are not biologically endangered or threatened and are not subject to Section 7 consultation.
EXP = experimental population. A taxon whose is listed as experimental (either essential or nonessential). Experimental, nonessential endangered species (e.g., red wolf) are treated as threatened on public land, for consultation purposes, and as species proposed for listing on private land.
P = proposed. Taxa proposed for official listing as endangered or threatened will be noted as "PE" or "PT", respectively.

Threatened due to similarity of appearance (T(S/A)):

In the November 4, 1997, Federal Register (55822-55825), the northern population of the bog turtle (from New York south to Maryland) was listed as T (threatened), and the southern population (from Virginia south to Georgia) was listed as T(S/A) (threatened due to similarity of appearance). The T(S/A) designation bans the collection and interstate and international commercial trade of bog turtles from the southern population. The T(S/A) designation has no effect on land management activities by private landowners in North Carolina, part of the southern population of the species. In addition to its official status as T(S/A), the U.S. Fish and Wildlife Service considers the southern population of the bog turtle as a Federal species of concern due to habitat loss.

Denotation of county records:

% A percent symbol (%) indicates that the species is regarded as probable but as of yet undocumented in this county due to the presence of potentially suitable habitat and/or the proximity of confirmed observations of the species in adjacent counties.
(S) Summer habitat (Indiana bat county records only)
*** Historic record - the species was last observed in the county more than 50 years ago.**
**** Obscure record - the date and/or location of observation is uncertain.**
***** Incidental/migrant record - the species was observed outside of its normal range or habitat.**
****** Historic and obscure record.**
******* Obscure and incidental record.**

A-6. NCDENR Comment Letter

NCDENR

North Carolina Department of Environment and Natural Resources

Michael F. Easley, Governor — William G. Ross Jr., Secretary

MEMORANDUM

TO: Chrys Baggett
State Clearinghouse

FROM: Melba McGee
Environmental Review Coordinator

SUBJECT: 06-0354 Scoping for the Proposed Repairs to the Blue Ridge Parkway at Milepost 270.3, Section 2E, in Wilkes County

DATE: July 6, 2006

The Department of Environment and Natural Resources has reviewed the proposed information. The attached comments are for the applicant's information.

Thank you for the opportunity to review.

Attachments

1601 Mail Service Center, Raleigh, North Carolina 27699-1601
Phone: 919-733-4984 \ FAX: 919-715-3060 \ Internet: www.enr.state.nc.us/ENR/

William G. Ross Jr., Secretary
North Carolina Department of Environment and Natural Resources
Alan W. Klimek, P.E. Director
Division of Water Quality

June 20, 2006

MEMORANDUM

To: Melba McGee, Environmental Coordinator

From: Sue Homewood, NC Division of Water Quality, Winston-Salem Office

Subject: Scoping comments on proposed repairs to the Blue Ridge Parkway at Milepost 270.3, Section 2E, Wilkes County. DENR #06-0354

Reference the National Park Service (NPS) correspondence dated June 1, 2006, and your correspondence dated June 5, 2006 in which you requested comments for the referenced project. Preliminary analysis of the project reveals the potential for multiple impacts to perennial streams and jurisdictional wetlands in the project area. More specifically, impacts to:

Stream Name	River Basin	Stream Classification(s)	Stream Index Number
Pine Swamp Creek	New	C +	10-1-24
Fall Creek	Yadkin	C, Tr	12-31-2-2

* This symbol identifies waters that are subject to a special management strategy specified in 15A NCAC 2B .0225 the Outstanding Resource Water (ORW) Rule, in order to protect downstream waters designated as ORW.

Further investigations at a higher resolution should be undertaken to verify the presence of other streams and/or jurisdictional wetlands in the area. In the event that any jurisdictional areas are identified, the Division of Water Quality requests that the applicant consider the following environmental issues for the proposed project:

Project Specific Comments:

1. Fall Creek and its tributaries are clas sC; Tr waters of the State. DWQ recommends that the most protective sediment and erosion control BMPs be implemented to reduce the risk of turbidity violations in trout waters. In addition, all disturbances within trout buffers should be conducted in accordance with NC Division of Land Resources and NC Wildlife Resources Commission requirements.

2. Review of the project reveals the presence of surface waters that drain directly into waters classified as Outstanding Resource Waters of the State in the project study area. The water quality classification of ORW is one of the highest classifications in the State. DWQ is extremely concerned with any impacts that may occur to streams with this classification. It is preferred that these resources be avoided if at all possible. If it is not possible to avoid these resources, the impacts should be minimized to the greatest extent possible. Given the potent for impacts to these resources during the project implementation, the DWQ requests that the applicant strictly adhere to North Carolina regulations entitled "Design Standards in Sensitive Watersheds" (15A NCAC 04B .0124) throughout design and construction of the project.

Transportation Permitting Unit
1650 Mail Service Center, Raleigh, North Carolina 27699-1650
2321 Crabtree Boulevard, Suite 250, Raleigh, North Carolina 27604
Phone: 919-733-1786 / FAX 919-733-6893 / Internet: http://h2o.enr.state.nc.us/ncwetlands

3. Given that the area requires repairs because of natural seeps, it is likely that there are jurisdictional wetlands that may be impacted by this project. Careful identification of jurisdictional wetlands, and impacts to any wetlands will be necessary.

General Project Comments:

4. The environmental document should provide a detailed and itemized presentation of the proposed impacts to wetlands and streams with corresponding mapping. If mitigation is necessary as required by 15A NCAC 2H.0506(h), it is preferable to present a conceptual (if not finalized) mitigation plan with the environmental documentation. Appropriate mitigation plans will be required prior to issuance of a 401 Water Quality Certification.

5. Environmental assessment alternatives should consider design criteria that reduce the impacts to streams and wetlands from storm water runoff. These alternatives should include road designs that allow for treatment of the storm water runoff through best management practices as detailed in the most recent version of NC DWQ *Stormwater Best Management Practices*, such as grassed swales, buffer areas, preformed scour holes, retention basins, etc.

6. After the selection of the preferred alternative and prior to an issuance of the 401 Water Quality Certification, the NPS is respectfully reminded that they will need to demonstrate the avoidance and minimization of impacts to wetlands (and streams) to the maximum extent practical. In accordance with the Environmental Management Commission's Rules {15A NCAC 2H.0506(h)}, mitigation will be required for impacts of greater than 1 acre to wetlands. In the event that mitigation is required, the mitigation plan should be designed to replace appropriate lost functions and values. The NC Ecosystem Enhancement Program may be available for use as wetland mitigation.

7. In accordance with the Environmental Management Commission's Rules {15A NCAC 2H.0506(h)}, mitigation will be required for impacts of greater than 150 linear feet to any single perennial stream. In the event that mitigation is required, the mitigation plan should be designed to replace appropriate lost functions and values. The NC Ecosystem Enhancement Program may be available for use as stream mitigation.

8. DWQ is very concerned with sediment and erosion impacts that could result from this project. NPS should address these concerns by describing the potential impacts that may occur to the aquatic environments and any mitigating factors that would reduce the impacts.

9. If foundation test borings are necessary; it should be noted in the document. Geotechnical work is approved under General 401 Certification Number 3494/Nationwide Permit No. 6 for Survey Activities.

10. Sediment and erosion control measures sufficient to protect water resources must be implemented and maintained in accordance with the most recent version of North Carolina Sediment and Erosion Control Planning and Design Manual and the most recent version of NCS000250.

11. All work in or adjacent to stream waters should be conducted in a dry work area unless otherwise approved by NC DWQ.

12. Sediment and erosion control measures should not be placed in wetlands and streams.

North Carolina Wildlife Resources Commission

Richard B. Hamilton, Executive Director

TO: Melba McGee, Environmental Coordinator
Office of Legislative and Intergovernmental Affairs, DENR

FROM: Marla Chambers, Western NCDOT Permit Coordinator Marla Chambers
Habitat Conservation Program, NCWRC

DATE: June 30, 2006

SUBJECT: Scoping review of the National Park Service's proposed project to repair a section of unstable roadbed on the Blue Ridge Parkway at milepost 270.3, Section 2E, Wilkes County, NC. OLIA Project No. 06-0354, due June 30, 2006.

The National Park Service is planning to prepare an Environmental Assessment for the proposed project. North Carolina Wildlife Resources Commission (NCWRC) has reviewed the information provided for concerns regarding impacts to fish and wildlife resources resulting from the subject project. Staff biologists have the following preliminary comments. These comments are provided in accordance with the provisions of the National Environmental Policy Act (42 U.S.C. 4332(2)(c)) and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661-667d).

The National Park Service proposes to repair approximately 200 linear feet of unstable roadbed on the Blue Ridge Parkway at milepost 270.3, Section 2E. Attempts to arrest the roadbed movement that began in 1975 have proven to be ineffective and now more advanced geotechnical solutions are being considered. Alternatives include concrete anchor blocks and replacing the section with a bridge that has either paved or grassed shoulders.

The project appears to be near the headwaters of Pine Swamp Creek, Class C+, that flows into Ashe County, or Fall Creek, Class C Tr., which flows into Wilkes County. Brook trout are known to inhabit these and other headwater streams in the area. Pine Swamp Creek joins the South Fork New River downstream, which appears to be Outstanding Resource Water and is inhabited by the Kanawha minnow (*Phenacobius teretulus*), a Federal Species of Concern and state Special Concern. Controlling off-site sedimentation will be very important for this project.

Mailing Address: Division of Inland Fisheries • 1721 Mail Service Center • Raleigh, NC 27699-1721
Telephone: (919) 707-0220 • **Fax:** (919) 707-0028

Sediment and erosion control measures should adhere to the design standards for sensitive watersheds.

It is likely that wetlands are present at the project site and that the roadway was built on wetlands, leading to the existing problems. Bog turtles, (*Glyptemys muhlenbergii*), state Threatened and federal Threatened due to Similarity of Appearance, are known from the general area. Rare salamanders may also exist at the project site. Surveys should be conducted to determine the potential impacts to rare and listed species. Impacts to wetlands should be avoided or minimized to the extent practicable. There may be an opportunity to restore wetlands in the area if a bridge alternative is selected, which, given the current information, will likely be the solution we'd recommend.

In addition, to help facilitate document preparation and the review process, our general information needs are outlined below:

1. Description of fishery and wildlife resources within the project area, including a listing of federally or state designated threatened, endangered, or special concern species. Potential borrow areas to be used for project construction should be included in the inventories. A listing of designated plant species can be developed through consultation with the following programs:

   The Natural Heritage Program
   http://www.ncsparks.net/nhp
   1601 Mail Service Center
   Raleigh, N. C. 27699-1601

   and,

   NCDA Plant Conservation Program
   P. O. Box 27647
   Raleigh, N. C. 27611
   (919) 733-3610

2. Description of any streams or wetlands affected by the project. If applicable, include the linear feet of stream that will be channelized or relocated.

3. Cover type maps showing wetland acreage impacted by the project. Wetland acreage should include all project-related areas that may undergo hydrologic change as a result of ditching, other drainage, or filling for project construction. Wetland identification may be accomplished through coordination with the U. S. Army Corps of Engineers (USACE). If the USACE is not consulted, the person delineating wetlands should be identified and criteria listed.

4. Cover type maps showing acreage of upland wildlife habitat impacted by the proposed project. Potential borrow sites and waste areas should be included.

5. Show the extent to which the project will result in loss, degradation, or fragmentation of wildlife habitat (wetlands or uplands).

6. Include the mitigation plan for avoiding, minimizing or compensating for direct and indirect degradation in habitat quality as well as quantitative losses.

7. Address the overall environmental effects of the project construction and quantify the contribution of this individual project to environmental degradation.

8. Provide a discussion of the probable impacts on natural resources, which will result from secondary development, facilitated by the improved road access.

9. If construction of this facility is to be coordinated with other state, municipal, or private development projects, a description of these projects should be included in the environmental document, and all project sponsors should be identified.

Thank you for the opportunity to provide input in the early planning stages of this project. If you have any questions regarding these comments, please contact me at (704) 545-3841.

cc: Marella Buncick, USFWS
Sue Homewood, NCDWQ
Angie Rodgers, NCNHP

A-7. Wilkes County Comment Letter

REQUEST FOR REVIEW

Please review the attached notification and indicate your response. If your agency requires additional information, contact the applicant directly or call High Country Council of Governments' Clearinghouse. Please submit your response to the address below by the due date indicated.
Phone: (828) 265-5434

SCH Number 06-E-0000-0354 Date 06-21-06 Response Date 06-28-06

Please Sign and Return
This Page Only To:

High Country Council of Governments
Clearinghouse Coordinator
P.O. Box 1820
Boone, NC 28607

JUN 2006
RECEIVED
Secretary's Office
DNA

Reviewers:

Gary Page, Wilkes County Manager

Response: This agency has reviewed the notification and offers the following recommendation: (Check appropriate response/more than one can be checked)

____ No Comment

✓ Favorable. The project is in agreement with the goals and objectives of this agency's programs.

____ Unfavorable. The project is not in agreement with the goals and objectives of this agency's programs.

____ Potential Problem (s). Identify:

Comments:

Reviewed by Gary L. Page

Name: Gary L. Page **Agency:** Wilkes Co. Govt. **Date:** 6/22/06

APPENDIX B: CHOOSING BY ADVANTAGE

Choosing by Advantage

In an effort to select the best alternative the National Park System uses a selection and ranking process that is based on the relative advantages and costs of each project in accomplishing service-wide goals and objectives. This process is called Choosing by Advantage (NPS, 1999). In using the Choosing by Advantage (CBA) process, the National Park Service asks itself "what and how large are the advantages of each project" proposed for consideration, "how important are the advantages of the projects", and finally "are those advantages worth their associated cost". Projects then compete against each other in the CBA process that evaluates all the projects relative to the following factors, which reflect the National Park Service mission:

- Protect cultural and natural resources
- Provide for visitor enjoyment
- Improve efficiency of park operations
- Provide cost-effective, environmentally responsible, and otherwise beneficial development for the National Park Service.

The results reflect total benefits of each project toward achieving the National Park Service mission. Cost is then introduced to the priority setting process, establishing an importance to cost ratio. The resulting priorities represent those projects which provide the greatest benefit to the National Park Service for each dollar spent.

During the period of July 26-28, 2005, a value analysis panel convened at the Holiday Inn Express in Boone, North Carolina. The purpose of this meeting was to select a preferred alternative to address the slide and unstable roadbed at MP 270.3. The Value Analysis (VA) team consisted of 14 participants:

Blue Ridge Parkway
John Gentry, Chief of Maintenance & Engineering
Gary Johnson, Supervisory Landscape Architect
Suzette Molling, Environmental Compliance Specialist
Mike Molling, Facility Manager
John Wilburn, Supervisory Civil Engineer
Larry Hultquist, Landscape Architect

Denver Service Center
Pat Sachs, VA Facilitator, Project Specialist
Leon Clifford, Project Manager
Al Hollister, Landscape Architect

Eastern Federal Lands Highway Division, Federal Highway Administration
Tom Shifflett, Project Manager
Mark Clabaugh, Bridge Engineer
Jonathan Woody, Lead Designer

The CBA was completed and later the graphs and charts were amended when more detailed geotechnical analysis reports for the slide area and updated Class C estimates for all three alternatives being proposed

were attained (Figures B-1 and B-2). With the new geotechnical analysis FHWA was able to better define conceptual design and cost estimates for all three alternatives in 2008 dollars.

The VA/CBA process indicates that with weighting of factors such as construction and life-cycle costs, resolution of slide stability and risk rating, environmental impact issues, and other VA/CBA factors, the anchor block system is considered the preferred design solution.

Figure B-1. CBA Chart

BLUE RIDGE PARKWAY – SLIDE MITIGATION

Choosing by Advantages

COMPONENT;					FUNCTION:	
FACTOR	ALTERNATIVES					
CBA – Version 1	Alternative A Re-alignment with upslope cut walls •		Alternative B Alignment as is with anchor block slope stabilization •		Alternative C Bridge spanning slide area •	
PROTECT CULTURAL AND NATURAL RESOURCES						
FACTOR 1 – Minimize impacts to forest vegetation						
Attributes • Amount of cleatring and grubbing required	• Disturbs .25 acres		• Disturbs 1.25 acres		• No disturbance to forest vegetation	
Advantages	Less disturbance than B	70	_____	0	Much less disturbance than B	80
FACTOR 2 – Avoid impacts to cultural landscape at site						
Attributes • Degree of change to historic designed section of parkway • Introduction of new materials	• Changes road alignmentand cross section • Introduces upslope cutwalls, fill walls and masonry		• Maintains existing alignment • No new materials to site		• Maintains existing alignment • Changes road section • Introduces a bridge	
Advantages	_____	0	Significantly Better than A	95	Much better than A	90
FACTOR 3 – Compatible with design features/characteristics of parkway development, in general						
Attributes • Degree to which solution is similar to historic parkway design features	• Upslope cut walls not used anywhere on parkway • Similar curves/broken back curves are used on the parkway where necessary • Not compatible		• Compatible		• Compatible	
Advantages	_____	0	Much more compatible than A	90	Much more compatible than A	90

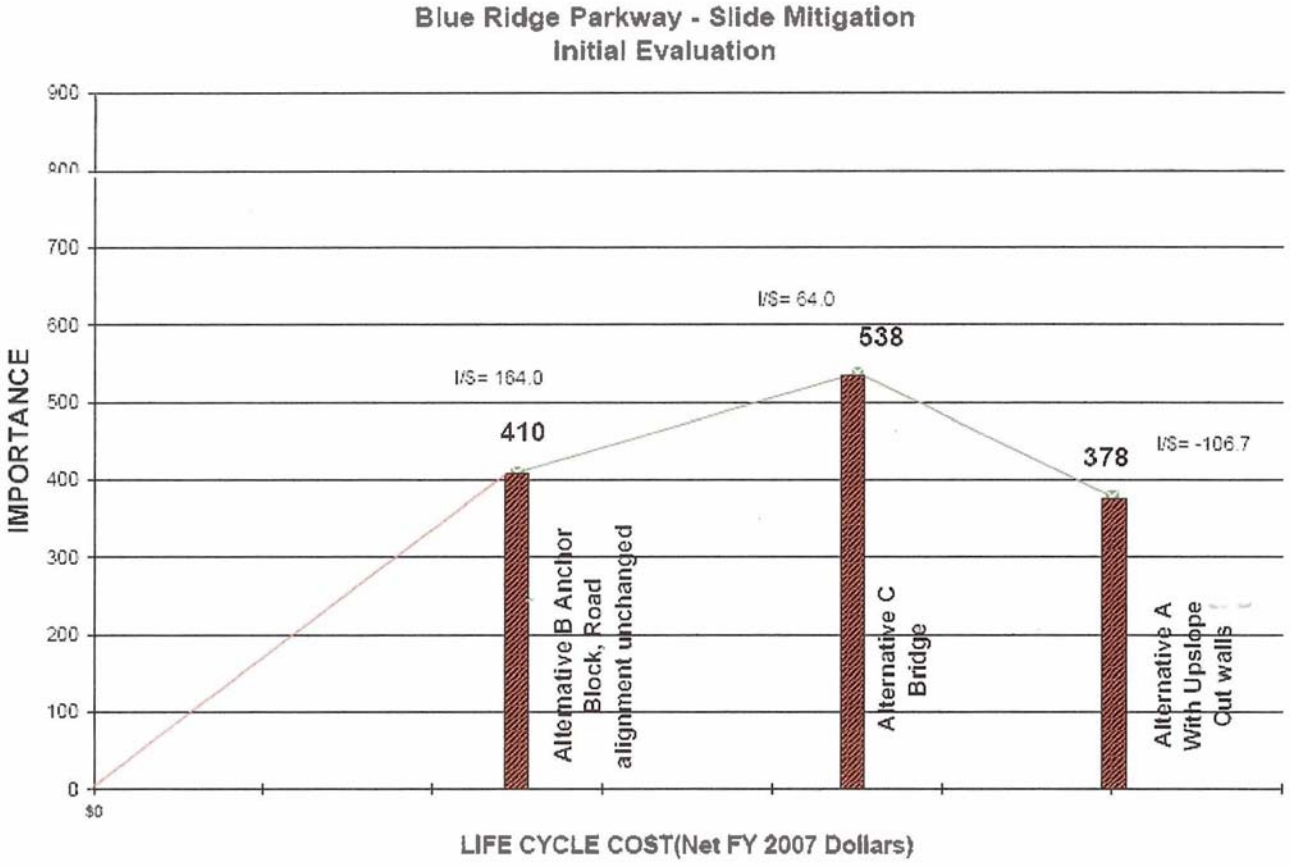
COMPONENT:					FUNCTION:	
FACTOR	ALTERNATIVES					
CBA – Version 1 PROVIDE FOR VISITOR ENJOYMENT	Alternative A Re-alignment with upslope cut walls		Alternative B Alignment as is with anchor block slope stabilization		Alternative C Bridge spanning slide area	
FACTOR 4 – Maintains scenic driving experience						
Attributes Long term impacts to driving experience	• Cutwalls and guardwall change scenery/experience		• Maintains experience		• Bridge changes experience	
Advantages		0	**Much better than A**	**85**	**Better than A**	**80**
FACTOR 5 – Minimizes 'down time' of parkway						
Attributes • Duration of parkway closure	• Some closure • Construction duration of 1 season		• No closure • Construction duration of 1 season		• Closure for duration of project • Construction duration of 2 seasons	
Advantages	Better than C	55	Much better than C	60		0
IMPROVE EFFICIENCY OF PARK MAINTENANCE OPERATIONS						
FACTOR 6 – Minimizes annual maintenance requirements						
Attributes • Approximate annual cost of maintenance at the site	• Approximately		• Approximately		• Approximately	
Advantages	Somewhat better than C	30	Better than C	35		0
FACTOR 7 - Protect Employee Health, Safety and Welfare of visitors and employees						
Factor 7A – Effectiveness of alternative at stabilizing slope/roadbed						
Attributes	• Avoids most of failed area		• Stabilizes road to prevent catastrophic failure • Road may still settle		• Spans failed area	

COMPONENT:					FUNCTION:	
FACTOR CBA – Version 1	ALTERNATIVES Alternative A Re-alignment with upslope cut walls		Alternative B Alignment as is with anchor block slope stabilization		Alternative C Bridge spanning slide area	
Advantages	Much better than B	88		0	Significantly better than B	98
PROVIDE COST-EFFECTIVE, ENVIRONMENTALLY RESPONSIBLE, AND OTHERWISE BENEFICIAL DEVELOPMENT FOR THE NPS						
Factor 7b – Reliability of roadway (degree of risk)						
Attributes	• May lose downslope fill, but not road, some risk		• May lose road • Moderate risk		• Not likely to lose road • Low risk or no risk	
Advantages	Significantly better than B	95		0	Significantly better than B	100
FACTOR 8 - Provide Other Advantages to the National Park System and Others						
Factor 8a – Minimizes impacts to local businesses communities						
Attributes	• Minor negative impact • Community likely to support project		• No impact • Community likely to support project		• Negative impact • Community less likely to support due to duration of construction period	
Advantages	Better than C		Much better than C	45		0
TOTAL IMPORTANCES OF ADVANTAGES		378		410		538
Initial Cost (Net)						
Re-design Cost	Additional Geotech needed, estimated at re-design cost not applicable		No geotech needed, re-design costs not applicable		Some geotech may be needed for bridge abutments, estimated at re-design costs not applicable	

COMPONENT:					FUNCTION:	
FACTOR CBA – Version 1	ALTERNATIVES Alternative A Re-alignment with upslope cut walls		Alternative B Alignment as is with anchor block slope stabilization		Alternative C Bridge spanning slide area	
Compliance	Full scale EA may not be necessary Section 106 compliance would be required, park could handle Section 106 internally		EA, including and section 106		EA, including Section 106 compliance	
Life Cycle Cost (Net)						
TOTAL Version 12.11.98						

Figure B-2. CBA Graph

Figure B-2. CBA Graph



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