307/D-232

National Park Service
U.S. Department of the Interior

Mesa Verde National Park
June 2003

Environmental Assessment and Assessment of Effect
Improvements to Park Entrance Road



Color Scans
8/11/2003

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Environmental Assessment/Assessment of Effect

Improvements to the Park Entrance Road

MESA VERDE NATIONAL PARK
COLORADO

Summary

This environmental assessment evaluates a planning action at Mesa Verde National Park that would improve and stabilize four sections of the park entrance road. The park is located in southwest Colorado in Montezuma County. The park is administered by the National Park Service and encompasses approximately 52,000 acres.

The preferred alternative would stabilize the slope and/or correct road failures at four sites along the entrance road. This road provides the only access to the park for employees and visitors. This project would result in approximately 9.4 acres of new disturbance to soils, vegetation and wildlife habitat. Visitor safety and experience would be improved with a more stable road surface and maintenance of the entrance road would be decreased.

Note to Reviewers and Respondents

If you wish to comment on the environmental assessment, you may mail comments to the name and address below. Our practice is to make comments, including names and home addresses of respondents, available for public review during regular business hours. Individual respondents may request that we withhold their home address from the record, which we will honor to the extent allowable by law. There also may be circumstances in which we would withhold a respondent's identity from the record, as allowable by law. **If you wish us to withhold your name and/or address, you must state this prominently at the beginning of your comment.** We will make all submissions from organizations, from businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses available for public inspection in their entirety. Comments should be addressed to the Superintendent at the address below and postmarked no later than July 15, 2003.

Superintendent
Mesa Verde National Park
Mesa Verde, Colorado 81330

United States Department of the Interior
NATIONAL PARK SERVICE
Mesa Verde National Park
Mesa Verde, Colorado 81330

In reply refer to:

D30 (MEVE-M)

Dear Friend:

Enclosed is a copy of the park's Improvements to Park Entrance Road Assessment and Assessment of Effect. The enclosed plan evaluates alternatives for repair of four (4) failing sections of the main entrance road.

This document addresses our compliance with the National Environmental Policy Act and Section 106 of the National Historic Preservation Act. We have sent a copy to the Colorado SHPO's office for review, and they have requested that we also provide your office with an opportunity to comment.

Two alternatives were considered:

Alternative A – No Action Alternative: This alternative proposes no changes to the existing roadway or associated pullouts or parking areas. Park maintenance would continue to patch potholes, clear rock fall debris and repair the road shoulders to maintain the current conditions. There would be no rehabilitation of the road corridor. If the road failed, then the park would close the road and emergency repairs would be made

Alternative B – The Preferred Alternative –Rehabilitate Road: The project would begin on the north slope of Point Lookout and consist of four sites on the park entrance road.

Site 1 – Point Lookout Retaining Walls: There are six locations in the Point Lookout (between milepost (mp) 2.2 and 3.0) area that are in need of stabilization. The fill slope below the roadway in this area is in danger of collapsing and needs to be stabilized. Nearly 13,000 square feet of walls would be installed along this site.

Site 2 – Horseshoe Bend (mp 6.2-6.4): Sandstone boulders have decomposed and settled in the fill structure causing the roadway above to crack and heave. Additionally, the embankment below the roadway was constructed at a highly steep angle. The preferred method of stabilization of the embankment would be to flatten the existing fill slope to approximately 1:2 by realigning the roadway about 38 feet to the west and maintaining the existing toe of the slope. The upper 6 feet of fill below the road would be reconstructed using high strength fabric (geogrid) to hold the surface together.

Site 3 – Line Change (mp 8.2): An unstable slope is threatening a pullout at this site. The preferred alternative for this location would be to remove a pullout, flatten the grade to a minimum 1:2 slope and install a guardrail.

Site 4 – Bravo Cut (B Cut) Westerly (mp 9.0-9.4): B Cut is a portion of the entrance road where the roadbed cuts across the face of a large escarpment. The road is constructed on large sandstone blocks that are deteriorating and threatening to fail. Additionally, the cut above the roadway is a constant safety and maintenance problem due to the steep slope unraveling and rocks falling onto the roadway. The preferred alternative at this site would shift the roadway into the hillside approximately 15 feet to avoid the sandstone blocks; cut a new slope at 1.5:1; and construct an 11 foot rock fall ditch that would be designed to catch approximately 90% of the material that falls off the cut. Additionally, the top of the cut slope would be rounded to aid in the re-vegetation efforts, soften the appearance of the cut, and to trim back some of the more decomposed strata of rock found near the top of the cut. Fill would be placed to the east of the cut to straighten out the approach an a small (about 10 cars) viewing area would be provided as a pullout.

The potential environmental consequences of the actions were evaluated for each alternative. This included determining impacts on natural resources, cultural resources, and several social and economic topics, including public health and safety, visitor use and experience, and park operation.

If you wish to comment on the environmental assessment and assessment of effect, you may mail comments to me at the address below. The document will be on public review for 30 days with a closing date for comments of Tuesday, July 15, 2003.

We appreciate your concern regarding the management of Mesa Verde National Park.

Sincerely,

Larry T. Wiese

Superintendent

Enclosure

ENVIORNMENTAL ASSESSMENT/ASSESSMENT OF EFFECT

IMPROVEMENTS TO PARK ENTRANCE ROAD

MESA VERDE NATIONAL PARK

Package MEVE 322

June 2003

MESA VERDE NATIONAL PARK
Montezuma County · Colorado

UNITED STATES DEPARTMENT OF THE INTERIOR/NATIONAL PARK SERVICE
DENVER SERVICE CENTER

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Purpose and Need

The purpose of this project is to correct road failures, perform slope stabilization, and improve safety on the park entrance road. This entrance road is the sole access for all visitors and employees into Mesa Verde National Park. This road is essential to the protection of the natural and cultural resources, visitor services, and all associated park operations. If the entrance road fails, the park would close since there is no other means of access into the park for either visitors or employees.

The roadway is carved precariously into steep unstable hillsides in route to the tops of high mesas and has a history of slope instabilities with failures occuring in 1979, 1983, and 1997. Currently, the road is slumping, uneven, and could collapse at several locations, especially in the cuts and steep slopes. Some areas have failed and are barricaded to protect visitors. Various sections of the road are located on unstable ground.

When completed, this project would stabilize major problem areas in the most vulnerable places. Roadway hazards would be significantly reduced, park operations secured, and the threat of danger to visitors and employees would be greatly reduced.

Background

The Roadway

The entrance road is the only access into Mesa Verde National Park. It begins at the junction of Highway 160 near the north boundary between Cortez and Mancos and traverses a 21-mile path through the park to the Headquarters area on Chapin Mesa.

Scoping and Issues

Scoping is the effort to involve agencies and the general public in determining the scope of issues to be addressed in the environmental document. Among other tasks, scoping determines important issues and eliminates issues that are not important; allocates assignments among the interdisciplinary team consisting of park management members and/or other participating agencies; identifies related projects and associated documents; identifies other permits, surveys, consultations etc. required by other agencies; and creates a schedule that allows adequate time to prepare and distribute the environmental document for public review and comment before a final decision is made. Scoping includes any interested agency or any agency with jurisdiction by law or expertise (including the US Fish and Wildlife Service, the Advisory Council on Historic Preservation [ACHP], the State Historic Preservation Officer [SHPO], and Indian Tribes) to obtain early input.

The US Fish and Wildlife Service, ACHP, SHPO, and interested Indian Tribes were contacted. A Park newsletter with information on the project was mailed out during January of 2002 and public meetings were held in the town of Mancos and the city of Cortez also in January 2002. Scoping was also undertaken with cultural affiliated tribes in September 2001 at Mesa Verde

National Park and March of 2002 at Acoma National Monument. No major issues were raised during public scoping.

Issues brought up during project planning by park staff include:

- **Visitor and employee safety.** The need for the road rehabilitation is great and would improve safety for both visitor and employees traveling through the park.
- **Use of cut material.** The issue of how to minimize and use cut material was discussed.
- **Identification and avoidance of sensitive resources.** Water sources and the big toothed maple, a species rare in Colorado, needed to be and were identified and avoided during the design and implementation of the project.
- **Potential impacts to the cultural landscape elements of the road.** Planning for the road considered its importance as a cultural landscape.

Previous Planning

In 1981 an environmental assessment was prepared on the entrance road and a finding of no significant impact was signed in 1983. That environmental assessment discussed some of the actions presented in this document, however, those designs have since been modified. This environmental assessment updates those design plans and related compliance.

Impact Topics

Impact topics are the resources or values of concern that could be affected by the range of alternatives. Specific impact topics are developed to ensure that alternatives were compared on the basis of the most relevant topics. The following impact topics were identified on the basis of federal laws, regulations, orders, and National Park Service *Management Policies, 2001*. A brief rationale for the selection of each impact topic is given in the table below, as well as the rationale for dismissing specific topics from further consideration.

IMPACT TOPICS RETAINED OR DISMISSED

Impact Topic	Retained or Dismissed	Rationale	Relevant Law, Regulation or Policy
Natural resource impact topics			
Geology and Soils	Retained	Soils and Geology would be analyzed since there would be cuts and fills associated with the alternatives	*NPS Management Policies*
Vegetation	Retained	Vegetation would be affected by road improvements.	*NPS Management Policies*

Impact Topic	Retained or Dismissed	Rationale	Relevant Law, Regulation or Policy
Wildlife	Retained	Wildlife and their habitats and movement corridors could be adversely affected.	NPS Organic Act; enabling legislation; *NPS Management Policies*
Air quality	Dismissed	Hauling material, operating equipment, and other construction activities could result in temporarily increased vehicle exhaust and emissions, However, hydrocarbons, NO_x, and SO_2 emissions, as well as airborne particulates created by fugitive dust plumes, would be rapidly dissipated by air drainage because air stagnation is rare at the project site. Overall, there could be a negligible degradation of local air quality; however, such effects would be temporary, lasting only as long as construction. Therefore, air quality was dismissed as an impact topic.	Clean Air Act and amendments; *NPS Management Policies*
Aquatic life	Dismissed	The areas that would be improved have been survey and no aquatic habitats are present and none would be affected by the alternatives.	*NPS Management Policies*
Biodiversity	Dismissed	None of the alternatives would result in the extinction or local extirpation of any species and would therefore not reduce biodiversity.	*NPS Management Policies*
Ecologically critical areas or other unique natural resources	Dismissed	No ecologically critical areas or other unique natural resources would be affected by any of the alternatives.	36 CFR 62 criteria for national natural landmarks; *NPS Management Policies*
Endangered and threatened species and critical habitats	Dismissed	There are no listed or endangered species or any critical habitats that would be affected by any alternative.	Endangered Species Act; *NPS Management Policies*
Energy requirements and conservation potential	Dismissed	Usage would not have appreciable effects that would affect energy availability or costs. Design would incorporate energy efficient and sustainable design to minimize energy consumption.	*NPS Management Policies*
Floodplains and Wetlands	Dismissed	The project area has been evaluated for the presence of wetlands and no wetlands would be impacted as the result of the proposed alternative. Any indirect impact would be avoided with the use of siltation fencing or similar mitigation. Also, there are no floodplains located in this phase of the road projects. Therefore, floodplains and wetlands were dismissed as impact topics in this document.	Executive Order 11988; Clean Water Act; *NPS Management Policies*

Impact Topic	Retained or Dismissed	Rationale	Relevant Law, Regulation or Policy
Lightscape Management	Dismissed	In accordance with National Park Service *Management Policies*, the National Park Service strives to preserve natural ambient landscapes, which are natural resources and values that exist in absence of human caused light. Mesa Verde National Park would limit the use of any artificial out door lighting to that which is necessary for basic safety requirements and would ensure that all outdoor lighting is shielded to the maximum extent possible, to keep light on the intended subject and out of the night sky. Therefore, lightscape management was dismissed as an impact topic.	NPS *Management Policies*
Prime and unique farmland	Dismissed	Prime or unique farmland is defined as soil that particularly produces general crops such as common foods, forage, fiber, and oil seed or unique farmland that produces specialty crops such as fruits, vegetables, and nuts. In addition, farming must be an acceptable land use on the property under consideration for the site to be considered as prime and unique farmland. None of the areas to be affected would be considered prime and unique farmland.	Council on Environmental Quality 1980 memorandum
Water quality	Dismissed	None of the alternatives would have direct effect on water quality. However, there is the potential for some erosional materials from the construction site to impact water quality. Mitigation such as silt fencing would be employed to reduce any adverse effects to water quality during construction to negligible or less.	Clean Water Act; Executive Order 12088; *NPS Management Policies*
Water supply	Dismissed	None of the alternatives would result in impacts to water supply	Endangered Species Act; Clean Water Act; *NPS Management Policies*
Wilderness	Dismissed	All of the actions proposed in the alternatives would take place outside areas designated as wilderness. Therefore impacts to wilderness are not discussed further.	Wilderness Act, *NPS Management Policies*
Soundscape Management	Dismissed	In accordance with *National Park Service Management Policies (2001)* and Director's Order #47, *Sound Preservation and Noise Management*, an important part of the National Park Service mission is preservation of natural soundscapes associated with National Park units. Natural soundscapes exist in the absence of human-caused sound. The natural ambient soundscape is the aggregate of all the natural sounds that occur in park units, together with the physical capacity for transmitting natural sounds. Natural sounds occur within and beyond the range of sounds that humans can perceive and can be transmitted	*NPS Management Policies*

Impact Topic	Retained or Dismissed	Rationale	Relevant Law, Regulation or Policy
		through air, water, or solid materials. The frequencies, magnitude and durations of the human-caused sound considered acceptable varies among National Park Service units, as well as potentially throughout each park unit, being generally greater in developed areas and less in undeveloped areas. Hauling material, operating equipment and other construction activities could result in dissonant human-caused sounds. However, all construction activity would occur along the entrance road, where protection of natural ambient soundscape and/or opportunity for visitors to experience natural sound environments is not an objective. Any dissonant sounds associated with construction would be temporary, lasting only as long as the construction activity generating the sound, and would negligibly impact visitor enjoyment of the park. Therefore, soundscape management was dismissed as an impact topic.	
Cultural resource impact topics			
Historic Structures/Cultural landscapes	Retained	The main entrance road is eligible for inclusion on the National Register of Historic Places and would be affected by the proposed action. Also, the scenery along the road to Point Lookout is a National Register eligible cultural landscape and protected under a 1931 amendment to the park's enabling legislation.	Sections 106 National Historic Preservation Act; Director's Order 28; *NPS Management Policies;* 1931 amendment to Enabling Legislation.
Archeological resources	Dismissed	The road corridor has been surveyed for any archeological resources within the project area. No resources were located. Therefore impacts to archeological resources are not evaluated.	Sections 106 of the National Historic Preservation Act; 36 CFR 800, ACHP regulations; Director's Order 28; *NPS Management Policies*
Museum Objects	Dismissed	No museum objects, including artifacts, photographs, documents, files, records, human remains, and floral and faunal specimens from Mesa Verde National Park would be affected by the alternatives.	Department of the Interior Manual on Museum Property Management 411 DM; NPS Museum Handbook; Director's Orders 24 and 28; National Park Service Special Directives 80-1 and 87-3; 36 CFR 79: Curation of Federally-Owned Archeological Collections Sections 106 of the National Historic Preservation Act; *NPS Management Policies*

Impact Topic	Retained or Dismissed	Rationale	Relevant Law, Regulation or Policy
Ethnographic Resources	Dismissed	Ethnographic resources are defined by the National Park Service as any "site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of group traditionally associated with it" (DO-28, *Cultural Resource Management Guideline, 181*). Mesa Verde National Park is adjacent to the Ute Indian Reservation and other Indian groups are also traditionally associated with park lands, These peoples' cultures are inextricably bound with the lands once occupied by their ancestors, and view much of the park landscape as spiritually active, containing sites vital to the continuity of their religious beliefs. A Navajo sweat lodge (MV3843) is located in the proposed area of construction; however the Bircher wild land fire in 2000 destroyed the site. After consulting the Navajo Nation, they determined there was no integrity of the site left in the aftermath of the fire. The Colorado State Historical Officer concurred with the determination. The letter is attached as Appendix B of this document There are no other eligible ethnographic sites with in the project area. Copies of the environmental assessment will be forwarded to each affiliated tribe for review and comment. If the tribes subsequently identify the presence of ethnographic resources, appropriate mitigation measures would be undertaken in consultation with the tribes. The location of ethnographic sites would not be made public. In the unlikely event that human remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered during construction, the Guideline for the Native American Graves Protection and Repatriation Act (25 USC 3001) of 1990 would be followed. Because there are no known ethnographic resources within the project area, ethnographic resources was dismissed as an impact topic	Sections 106 and 107 of the National Historic Preservation Act; Native American Graves Protection and Repatriation Act of 1990; Executive Order 13007; Director's Order 28; *NPS Management Policies*
Visitor use and experience impact topics			
Visitor use and experience	Retained	The topics of visual quality (scenic views) and visitor mobility could be affected by the alternatives.	Organic Act; NPS *Management Policies*
Visitation levels	Dismissed	There is not expected to be a change in visitation levels as a result of any of the alternatives.	Organic Act; NPS *Management Policies*

Impact Topic	Retained or Dismissed	Rationale	Relevant Law, Regulation or Policy
Socioeconomic impact topics			
Regional Economy	Dismissed	The local economy and most businesses within the communities adjacent to the park are based on professional services, construction, tourism, and light industry. Should the preferred alternative be implemented, the local and regional economy would realize short-term economic benefits from construction related expenditures. It is possible that employment opportunities relating to support of the road construction project may be generated. Any increase, however, would be negligible and temporary, lasting only as long as construction. Therefore, regional economy was dismissed as an impact topic in this document.	National Environmental Policy Act
Indian Trust Resources	Dismissed	Secretarial Order 3175 requires that any anticipated impacts to Indian trust resources from a proposed project or action by Department of interior agencies be explicitly addressed in environmental documents. The federal Indian trust responsibility is legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes. There are no Indian trust resources in Mesa Verde National Park. The lands comprising the park are not held in trust by the Secretary of the Interior for the benefit of Indians due to their status as Indians. Therefore, Indian trust resources was dismissed as an impact topic.	Secretarial Order 3175
Environmental justice	Dismissed	Executive Order 12898, "General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. No alternative would have disproportionate health or environmental effects on minorities or low-income populations or communities as defined in the Environmental Protection Agency's Draft Environmental Justice Guidance (July 1996). Therefore this topic will not be addressed further.	Executive Order 12898
Park administration impact topics			
Operations	Retained	Park operations would be affected by the proposed action.	*NPS Management Policies*
Staffing	Dismissed	The alternatives would not affect park staffing.	*NPS Management Policies*

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Alternatives

Introduction

The alternatives section describes a no action and a preferred management alternative for the rehabilitation of the park entrance road. The preferred alternative for this project was developed to resolve pertinent visitor use, resource, and management issues.

The **no action alternative** which describes the action of continuing the present management operation and condition, does not imply or direct discontinuing the present action or removing existing uses, developments, or facilities. The no action alternative provides a basis for comparing the management direction and environmental consequences of the proposed action

The **preferred alternative** presents the NPS preferred course of action and defines the rationale for the action in terms of resource protection and management, visitor and operational use, costs, and other applicable factors. All actions described in the preferred alternative are consistent with the park's General Management Plan and related park documents.

The **environmentally preferred alternative** is the alternative that would promote the national environmental policy as expressed in Section 101 of NEPA.

A summary table comparing the environmental consequences of each alternative is presented at the end of the alternatives section.

Alternative A
No Action

This alternative proposes no changes to the existing roadway or associated pullouts or parking areas. Park maintenance would continue to patch potholes, clear rockfall debris and repair the road shoulders to maintain the current conditions. There would be no rehabilitation of the road corridor. If the road failed then the park would close the road and emergency repairs would be made.

Alternative B
The Preferred Alternative – Rehabilitate Road

The project would begin on the north slope of Point Lookout and consist of four sites on the park entrance road.

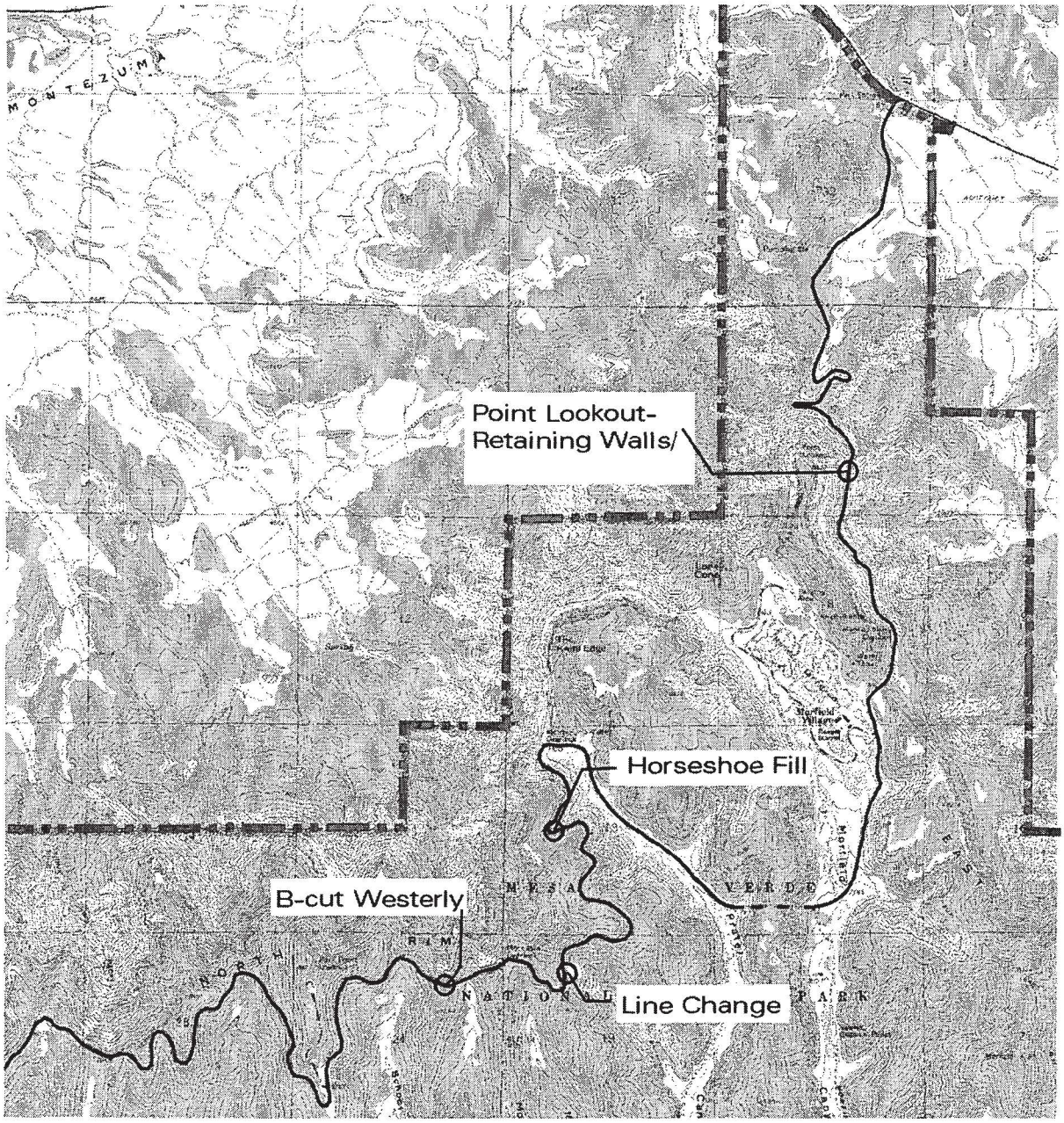
Site 1 – Point Lookout Retaining Walls: There are six locations in the Point Lookout (between milepost (mp) 2.2 and 3.0) area that are in need of stabilization. The fill slope below the roadway in this area is in danger of collapsing and needs to be stabilized. Tieback retaining walls were first installed near this area approximately twenty years ago and have proven to be a successful solution to keep the roadway stabilized. Nearly 13,000 sq. feet of walls would be installed along this site.

Site 2 – Horseshoe Bend (mp 6.2-6.4): After the road was realigned to its present alignment at this bend, several construction-related problems were discovered. First, when the road embankment was being constructed, large sandstone boulders were placed in the fill. Over time, these sandstone boulders have decomposed and settled, causing the roadway above to crack and heave. Additionally, in an effort to protect trees at the toe of the slope, the embankment below the roadway was constructed at a highly steep angle. This has resulted in an unstable embankment below the road and slumping of the road's pavement. The preferred method of stabilization of the embankment would be to flatten the existing fill slope to approximately 1:2 by realigning the roadway about 38 feet to the west and maintaining the existing catch point. Geotechnical tests indicate that the boulders have decomposed to the point that any voids resulting from their placement have been filled in. However, to minimize future surface movements, the upper 6 feet of fill below the road would be reconstructed using high strength fabric to hold together the surface (geogrid).

Site 3 – Line Change (mp 8.2): An unstable slope is threatening a pullout at this site. Because this pullout began as an informal pullout at a wide spot in the road, the preferred alternative for this location would be to remove the pullout, flatten the grade to a minimum 1:2 slope, and install a guardrail.

Site 4 – Bravo (B cut) Westerly (mp 9.0-9.4): B Cut is a portion of the entrance road where the roadbed cuts across the face of a large escarpment. The road is constructed on large sandstone blocks that are deteriorating and threatening to fail. Additionally, the cut above the roadway is a constant safety and maintenance problem due to the steep slope unraveling and rocks falling onto the roadway. The preferred alternative at this site would shift the roadway into the hillside approximately 15 feet to avoid the sandstone blocks, cut a new slope at 2:1, and construct an 11-foot rockfall ditch that would be designed to catch approximately 90% of the material that falls off the cut. Additionally, the top of the cut slope would be rounded to aid in the revegetation efforts, soften the appearance of the cut, and to trim back some of the more decomposed strata of rock found near the top of the cut. Fill would be placed to the east of the cut to straighten out the approach and a small (about 10 cars) viewing area would be provided as a pull out.

Construction Staging: Construction would be staged on the road corridor and from an area near Morefield Campground. This area has been used recently (the past two years) for the slope stabilization project along the entrance road at the Boulder Nest near Point Lookout. This staging area has been heavily impacted from previous use and there would be no impacts to any known cultural or natural resources. The construction staging site is out of the way from visitor use and provides a good location as it is central to the project sites. At B-Cut vehicles would be staged only inside the area of construction.



Project Locations
Improvements to Park Entrance Road
Mesa Verde National Park
Colorado



Site 1 – Point Lookout retaining walls



Site 2 – View of inside Horseshoe Bend



Site 2 – View of road surface at Horseshoe Bend



Site 3 – Line Change

=



Site 4 – B Cut Westerly

View of cut and road surface (note barrier to protect road and vehicles from falling rocks)

Other Options Considered but Dismissed

Other options for treatment of the road were considered preliminarily. None of these options were fully developed as alternatives since they did not completely meet the goals of the project and were dismissed. These options and the reasons for dismissal are discussed briefly below.

Site 1 - Point Lookout Walls: Anchor blocks were considered at as an option to the tieback retaining walls at Point Lookout. However, the anchor blocks require stable slopes below them in order to be fully effective. At Point Lookout the slopes below the roadway are generally unstable. There is a risk that future slides would undermine the anchor block system.

Site 2 - Horseshoe Bend: Three additional options were considered (none of these options alone solved the problems of stability and safety):

> Option 1 – Remove the extra pavement placed in previous repairs, lower the grade, and reconstruct the upper two meters of the fill using geogrid reinforcement to minimize future surface movements.
>
> Option 2 – Reconstruct the fill and flatten the fill slope to 1:2 by keeping the roadway where it is and extending the fill slope to a new point further out from the existing point.
>
> Option3 -- Flatten the existing fill slope to a 1:1.75 and use geogrid reinforcement to stabilize the slope.

Site 3 - Line Change: The Federal Highway designers also proposed constructing a tie-back retaining wall on the outside edge of the pullout at this location, replacing guardrail, and reconstructing the pullout. The cost-benefit of retaining the pullout was evaluated and it was determined that the pullout was not essential because others were located nearby so this option was dismissed and not fully developed.

Site 4 – B Cut Westerly: Three options were explored for the work at this site in addition to the preferred alternative.

> Option 1 – Keep the road where it is and construct mechanically stabilized earth walls in conjunction with rock bolting to stabilize the sandstone blocks where feasible. This alternative had the least visual impact and impacted the resources the least but did not address the rockfall issue. Additionally, there were concerns about the long-term stability and maintenance concerns and constructability of retaining walls in an unstable rock strata.
>
> Option 2 – Shift the roadway approximately 5 meters into the hill and lay back the cut slope at a 1:2 or 1:3 slope. This alternative virtually eliminated the rockfall problems but had the greatest impact to the resources and required moving between 218,000 and 471,000 cubic meters of cut depending on the slope. Transporting of this amount of material out of the park would damage the existing roadway. Also the impacts of material disposal would be high.

Option 3 – Abandon the existing roadway location and reconstruct the roadway around the ridge to the south. This alternative seemed to improve winter maintenance because of the southern exposure, increase safety due to less icing and drifting of snow in the winter, and avoid the rockfall potential. However, this alternative also added 1.2 miles of roadway to the park system, increased maintenance costs, increased travel time and cost for visitors and employees, required two sharp-radius turns, and increased the visual impact and therefore was dismissed from full evaluation.

Mitigation

Mitigation measures are analyzed as part of the preferred alternative. These actions have been developed to lessen the adverse effects of this alternative.

Revegetation: Revegetation plantings would use native species from genetic stocks originating in Mesa Verde National Park. Revegetation objectives would be to reconstruct the natural spacing, abundance, and diversity of native plant species. In most areas, soils and vegetation are already impacted to a degree by existing facilities and human activity. In an effort to avoid introduction of exotic plant species, no imported topsoil or hay bales would be used.

Vegetation impacts and potential compaction and erosion of bare soils would be minimized by conserving topsoil in windrows, replacement of topsoil in as near as original location as possible, scarification, mulching, and seeding and/or planting with species native to the immediate area.

Cultural Resources Mitigation:. If during construction previously undiscovered archeological resources are discovered, all work in the immediate vicinity of the discovery would be halted until the resources could be identified and documented and an appropriate mitigation strategy developed, if necessary, in consultation with the Colorado State Historic Preservation Office. In the unlikely event that human remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (25 USC 3001) of 1990 would be followed.

Other mitigation would include revegetation as mentioned above and grading of cut areas to provide a less artificial looking landscape. Retaining walls would be colored to meld with the existing wall and landscape.

Environmentally Preferred Alternative

In accordance with National Park Service Diretor's Order #12 (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 the National Environmental Policy Act (NEPA) of 1969, which is guided by the Council on Environmental Quality (CEQ). The CEQ provides direction that "[t]he environmentally preferable alternative is the alternative that would promote the national environmental policy as expressed in Section 101 of NEPA, which considers:

1. fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
2. assure for all generations safe, healthful, productive, and esthetically and culturally pleasing

surroundings;

3. attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;
4. preserve important historic, cultural and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice;
5. achieve a balance between population and resource use that would 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."

The no action alternative represents the current road conditions without any major stabilization. This alternative would have the fewest initial impacts to the park's natural and cultural resources. Over the long-term, as the road continued to degrade, there would be the likelihood of a catastrophic failure that could lead to moderate adverse impacts to the cultural landscape of the road. In addition, this alternative would not meet the provisions of goals 2 and 3, which assure a safe environment for people. The preferred alternative would further the goals of provisions 2 and 3 by providing safer travel through the park with an improved road. Also, the preferred alternative does better at achieving provision 4 and 5 by both preserving important historic, cultural resources and achieving a balance between population and resource use. This would be accomplished by maintaining the historic integrity of the road and better guaranteeing access to the park's world class archeological resources. The National Park Service has determined that the environmentally preferable alternative is the preferred alternative since it goes further in attaining the goals of Section 101 of NEPA.

Alternative Table

Project Area	Alternative A (No Action)	Alterantive B (Preferred Action)
Site 1 – Point Lookout Retaining Walls	No Change	There are six locations in the Point Lookout area that are in need of stabilization. About 13,000 sq. feet of wall would be installed at this site.
Site 2 – Horseshoe Bend	No Change	The method of stabilizing the embankment would be to flatten the existing fill slope to approximately 1:2 by realigning the roadway about 38 feet to the west and maintaining the existing catch point. To minimize future surface movements, the upper 6 feet of fill below the road would be reconstructed using geogrid reinforcement.
Site 3 – Line Change	No Change	The pullout would be removed, the grade flattened to a minimum 1:2 slope, and a guardrail installed.
Site 4 – B Cut Westerly	No Change	The roadway would be shifted into the hillside approximately 15 feet to avoid the sandstone blocks with a new cut slope at 1.5:1, and construct an 11-foot rockfall ditch that would be designed to catch approximately 90% of the material that falls off the cut. Additionally, the top of the cut slope would be rounded to aid in the revegetation efforts, soften the appearance of the cut, and to trim back some of the more decomposed strata of rock found near the top of the cut. Fill would be placed to the east of the cut to straighten out the approach and a small (about 10 cars) parking area would be provided as a pull out.

Impact Matrix

Impact Topic	Alternative A (No Action)	Alterantive B (Preferred Action)
Geology and Soils	No Change	Alternative B would have a negligible to minor long-term adverse effect on the geology and soils of the park with 9.4 acres of new disturbance. Most all of the areas that would be affected by soil cut and fill as a result of Alternative B is in degraded condition as a result of previous road construction or rehabilitation and/or its close proximity to the road.
Vegetation	No Change	Overall, Alternative B would have negligible to minor adverse effects on the vegetation in the park with 9.4 acres of new disturbance. Much of the areas that would be affected by disturbance as a result of Alternative B are in degraded condition as a result of previous road construction or rehabilitation and/or their close proximity to the road. All disturbed areas would be revegetated.
Wildlife	No Change	Alterative B would have a minor short-term and long-term adverse effect on the wildlife along the road corridor as a result of construction activity and a small loss of wildlife habitat.
Historic Structures/Cultural Landscapes	Alternative A would result in no modifications or alterations to the road. Therefore, the No Action Alternative would have no known short or long-term, or cumulative effect on the road. However, emergency repairs in the event of sudden catastrophic failures would result in site-specific alterations to the road corridor that could have locally considerable long-term impacts to the cultural landscape.	Alternative B would result in minor, long-term adverse effects and minor short-term adverse effects to the Entrance Road. Alternative B would not only result in less of an effect to the historic cultural landscape and historic road, but it also would provide for the greatest potential to mitigate any adverse effects by reducing the chance of catastrophic failure.
Visitor Use and Experience	No action could result in a moderate adverse impact to the visitor experience if the road would close due to failure.	Alternative B would have minor to moderate beneficial long-term effects to the visitor experience since road stability and safety would be increased. There would be some adverse short-term negligible impacts (dust, noise, short construction delays) as a result of construction.

Impact Topic	Alternative A (No Action)	Alterantive B (Preferred Action)
Park Operations	Park staff would continue routine maintenance along the roadway, but rock fall and road cracks would tend to slowly increase over time As the roadway condition continues to deteriorate, the need for emergency repairs would likely increase and maintenance of the road would demand more park staff time and funds. This would be a minor to moderate long-term adverse effect on park operations.	The service life of the park's main road would be extended by several decades and cyclic maintenance requirements would decrease. Thus, present impacts to park operations would be appreciably reduced due to decreased maintenance of road and parking area surfaces, a moderate, beneficial long-term effect. Short-term adverse impacts would be due to an increase of workload on employees and access during construction.

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Affected Environment / Environmental Consequences

This section presents a short description of the impact topics considered and the environmental consequences of each alternative.

Methodology

For each impact topic, the analysis includes a description of the affected environment and an analysis of the environmental consequences using the methods and terms presented in this section.

The impact analysis involved the following steps.

- Identify the area that could be affected either directly or indirectly.
- Compare the area of potential effect with the resources that are present.
- Identify the intensity, context (are the impacts site-specific, local, or regional), and duration (short- term, long-term or permanent), both as a result of this action and from a cumulative effects perspective. Identify whether effects would be beneficial or adverse. The criteria used to define the intensity of impacts associated with the alternatives are presented in following table.
- Identify mitigation measures that may be employed to offset potential adverse impacts.
- The impact analyses were based on professional judgment using information provided by park staff, professional consultants, relevant references and technical literature citations, and subject matter experts.

Cultural Resource Analysis Method

Impacts to historic structures/cultural landscapes are described in terms of type, context, duration, and intensity, as described above, which is consistent with the regulations of the Council on Environmental Quality (CEQ 1978) that implement the National Environmental Policy Act. These impact analyses also are intended to comply with the requirements of both the National Environmental Policy Act and Section 106 of the National Historic Preservation Act. In accordance with the Advisory Council on Historic Preservation's regulations implementing Section 106 of the National Historic Preservation Act (36 CFR Part 800, Protection of Historic Properties), impacts to cultural resources were identified and evaluated by:

- Determining the area of potential effects;
- Identifying cultural resources present in the area of potential effects that are either listed in or eligible to be listed in the National Register of Historic Places;
- Applying the criteria of adverse effect to affected resources either listed in or eligible to be listed in the National Register; and
- Considering ways to avoid, minimize or mitigate adverse effects.

Under the Advisory Council's regulations, a determination of either *adverse effect* or *no adverse effect* must also be made for affected cultural resources. An *adverse effect* occurs whenever an impact alters, directly or indirectly, any characteristic of a cultural resource that qualifies it for inclusion in the National Register. For example, this could include diminishing the integrity of the resource's location, design, setting, materials, workmanship, feeling, or association. Adverse effects also include reasonably foreseeable effects caused by the alternative that would occur later in time, be farther removed in distance or be cumulative (36 CFR Part 800.5, *Assessment of Adverse Effects*). A determination of *no adverse effect* means there is an effect, but the effect would not diminish in any way the characteristics of the cultural resource that qualify it for inclusion in the National Register.

Council on Environmental Quality regulations (CEQ 1978) and *Director's Order #12 and Handbook: Conservation Planning, Environmental Impact Analysis, and Decision Making* (NPS 2001b) call for a discussion of the appropriateness of mitigation, as well as an analysis of how effective the mitigation would be in reducing the intensity of a potential effect, such as reducing the intensity of an impact from major to moderate or minor. Any resulting reduction in intensity of impact by mitigation, however, is an estimate of the effectiveness of mitigation under the National Environmental Policy Act only. It does not suggest that the level of effect as defined by Section 106 is similarly reduced. Although adverse effects under Section 106 may be mitigated, the effect remains adverse.

A Section 106 summary is included in the impact analysis for historic structures/cultural landscapes. The summary is intended to meet the requirements of Section 106 and is an assessment of the effect of implementing the alternative on historic structures/cultural landscapes, based on the criteria of effect and adverse effect found in the Advisory Council's regulations.

Impact Threshold Definition Table

Impact Topic And Duration	Impact Threshold Definition			
	Negligible	Minor	Moderate	Major
Soils and Geology *Short-term - Recovers in less than 3 years.* *Long-term - Takes more than 3 years to recover.*	Soils would not be affected or the effects would be below or at lower levels of detection. Any effects on soil productivity or fertility would be slight.	Effects on soil would be detectable. Effects on soil productivity or fertility would be small. As would the area affected. If mitigation were needed to offset adverse effects, it would be relatively simple to implement and would likely be successful.	The effect on soil productivity or fertility would be readily apparent and result in a change to the soil character over a relatively wide area. Mitigating measures would probably be necessary to offset adverse effects and would likely be successful.	The effect on soil productivity or fertility would be readily apparent, and substantially change the character of the soil over a large area in and out of the park. Mitigating measures to offset adverse effects would be needed, extensive, and their success could not be guaranteed.
Vegetation *Short-term - Recovers in less than 3 years.* *Long-term - Takes more than 3 years to recover.*	No native vegetation would be affected or some individual native plants could be affected as a result of the alternative, but there would be no effect on native species populations. The effects would be on a small scale, and no species of special concern would be affected.	The alternative would affect some individual native plants and also would affect a relatively minor portion of that species' population. Mitigation to offset adverse effects, including special measures to avoid affecting species of special concern, could be required and would be effective.	The alternative would affect some individual native plants and also would affect a sizeable segment of the species' population over a relatively large area. Mitigation to offset adverse effects could be extensive, but likely would be successful. Some species of special concern could also be affected.	The alternative would have a considerable effect on native plant populations, including species of special concern, and affect a relatively large area in and out of the park. Mitigation measures to offset the adverse effects would be required, extensive, and success of the mitigation measures would not be guaranteed.
Wildlife *Short-term - Recovers in less than 1 year.* *Long-term - Takes more than 1 year to recover.*	Wildlife would not be affected or the effects would be at or below the level of detection and the changes would be so slight that they would not be of any measurable or perceptible consequence to the wildlife species' population.	Effects to wildlife would be detectable, although the effects would be localized and would be small and of little consequence to the species' population. Mitigation measures, if needed to offset adverse effects, would be simple and successful.	Effects to wildlife would be readily detectable and localized, with consequences at the population level. Mitigation measures, if needed to offset adverse effects, would be extensive and likely successful.	Effects to wildlife would be obvious and would have substantial consequences to wildlife populations in the region. Extensive mitigation measures would be needed to offset any adverse effects and their success would not be guaranteed.

Impact Topic And Duration	Impact Threshold Definition			
	Negligible	Minor	Moderate	Major
Cultural Landscapes *Short-term - Treatment effects on the natural elements of a cultural landscape may be comparatively short-term (e.g., 3 to 5 years) until new vegetation grows or historic plantings are restored.* *Long-term - Because most cultural resources are non-renewable, any effects on archeological, historic, or ethnographic resources, and on most elements of a cultural landscape, would be long-term.*	Effects would be at the lowest levels of detection — barely perceptible and not measurable. For section 106 purposes, the determination of effect would be *no adverse effect.*	**Adverse effect** — the action would not affect the character defining patterns and features of a cultural landscape eligible for listing or listed on the National Register of Historic Places. For section 106 purposes, the determination of effect would be *no adverse effect.* **Beneficial effect** — preservation of character defining patterns and features in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties With Guidelines for the Treatment of Cultural Landscapes.* For section 106 purposes, the determination of effect would be *no adverse effect.*	**Adverse effect** — the action would alter a character defining pattern(s) or feature(s) of the cultural landscape but would not diminish the integrity of the landscape to the extent that its national register eligibility would be jeopardized. For section 106 purposes, the determination of effect would be *no adverse effect.* **Beneficial effect** — rehabilitation of a landscape or its patterns and features in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties With Guidelines for the Treatment of Cultural Landscapes.* For section 106 purposes, the determination of effect would be *no adverse effect.*	**Adverse effect** — the action would alter a character defining pattern(s) or feature(s) of the cultural landscape, diminishing the integrity of the landscape to the extent that it no longer would be eligible for listing on the national register. For section 106 purposes, the determination of effect would be *adverse effect.* **Beneficial effect** — restoration of a landscape or its patterns and features in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties With Guidelines for the Treatment of Cultural Landscapes.* For section 106 purposes, the determination of effect would be *no adverse effect.*
Visitor use and experience *Short-term - occurs only during the treatment period.* *Long-term – effect extends beyond the treatment period.*	Visitors would not be affected or changes in visitor use and/or experience would be below or at the level of detection. The visitor would not likely be aware of the effects associated with the alternative.	Changes in visitor use and/or experience 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.	Changes in visitor use and/or experience would be readily apparent. The visitor would be aware of the effects associated with the alternative and would be able to express an opinion about the changes.	Changes in visitor use and/or experience would be readily apparent and have important consequences. The visitor would be aware of the effects associated with the alternative and likely would express a strong opinion about the changes.

Impact Topic And Duration	Impact Threshold Definition			
	Negligible	Minor	Moderate	Major
Park operations *Short-term - occurs only during the treatment period.* *Long-term – effect extends beyond the treatment period.*	Park operations would not be affected or the effect would be at or below the lower levels of detection, and would not have an appreciable effect on park operations.	The effect would be detectable, but would be of a magnitude that would not have an appreciable effect on park operations. If mitigation were needed to offset adverse effects, it would be relatively simple and likely successful.	The effects would be readily apparent and would result in a substantial change in park operations in a manner noticeable to staff and the public. Mitigation measures would probably be necessary to offset adverse effects and likely would be successful.	The effects would be readily apparent and would result in a substantial change in park operations in a manner noticeable to staff and the public and be markedly different from existing operations. Mitigation measures to offset adverse effects would be needed, would be extensive, and their success could not be guaranteed.

Cumulative Effects Analysis Method

The Council on Environmental Quality (CEQ 1978) regulations for implementing the National Environmental Policy Act require assessment of cumulative effects in the decision-making process for federal projects. Cumulative effects are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR 1508.7). Cumulative effects are considered for both the no action and proposed action alternatives.

Cumulative effects were determined by combining the effects of the alternative with other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other past, ongoing, or reasonably foreseeable future actions at Mesa Verde National Park and in the surrounding region. Other actions that have the potential to have a cumulative effect in conjunction with development of the Cultural Center are described previously in this document, in the section titled Other Projects and Plans Occurring in the Vicinity.

Projects and Plans Occurring in the Park and Vicinity

Projects and plans that are in the vicinity of the entrance area, both in the park and on nearby private lands, and have potential to effect the local environment include:

Park Plans

- **Upgrades to the existing entrance stations.** The stations currently have severe health and safety concerns and there are plans to alleviate these concerns. The park is in the early stages of planning; however the stations are expected to stay near their current location.

- **Transportation Plan and Environmental Impact Statement:** An environmental impact statement is in preparation to examine visitor distribution and formulate transportation strategies to address park congestion and to improve the visitor experience.

- **Wetherill Mesa Road:** A complete reconstruction of the 12 mile long paved roadway from Farview to Wetherill Mesa is tentatively scheduled for 2009. The work will consist of vertical and horizontal realignment to allow for all types of traffic to that area. The required compliance documents will be issued within the year prior to construction.

- **Farview Lodge Redevelopment.** An Environmental Assessment is currently under preparation to upgrade the concessionaire operated guest facilities at the Farview area. The new reconstruction will be in conjunction with a new concessions contract beginning in 2004.

- **Raw Water Intake and Waterline Reconstruction:** The park's existing main water intake and water line, which originates 17 miles outside the park, needs to be repaired. An environmental assessment did determine a cost-effective solution while minimizing impacts on the environment and affected properties.

- **Cultural Center:** An environmental assessment has been prepared for the park's planned cultural center near the entrance. The proposed facility is 96,000 square feet with multiple purposes and an additional 36,000 square feet of outdoor interpretative plazas and amphitheater.

- **Headquarters Utility:** Plans to replace underground fuel oil storage tanks in the historic district and update the old heating systems in the Museum, Headquarters Building, and Chief Ranger's Office are progressing. An environmental assessment would help identify cost-effective ways to accomplish these tasks while minimizing environmental impacts.

- **Fire Management Plan:** An EIS is being prepared for the Fire Management Plan. The plan will develop fire management objectives and actions for accomplishing those objectives. The plan would include consideration of fire suppression, prescribed fire, fire use, hazardous fuels/mechanical fuels reduction, and wildland/fire urban interface problems.

- **Housing Development/Trailer Replacement Plan:** The trailers (mobile homes) used as employee housing in the park are inadequate. This plan, and the associated environmental assessment, will evaluate alternatives to replace these trailers with adequate housing for park employees required to live in the park.

Plans Occurring in the Vicinity

- Cedar Mesa residential development. Approximately 1,800 acres north of Highway 160 and north of the park entrance are under development as residential housing. The lots range in size from 1 to 30 acres. Utilities have been developed and houses are in various stages of construction.

- Properties east of the entrance area are likely to be developed, both for commercial and residential uses, in the near future.

- Bureau of Land Management lands in the park entrance vicinity have mineral rights that may be available for lease or sale and this could result in resource (e.g., oil and natural gas) mining or drilling activities.

Impairment Analysis Method

The *National Park Service Management Policies* (NPS 2001a) requires analysis of potential effects to determine whether or not actions would impair park resources or values.

The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. And, the park's enabling legislation, as amended, further mandates resource protection. National Park Service managers must always seek ways to avoid, or to minimize to the greatest degree practicable, actions that would adversely affect park resources and values.

These laws give the National Park Service the management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, so long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the National Park Service the management discretion to allow certain impacts within parks, that discretion is limited by the statutory requirement that the National Park Service 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 National Park Service manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. An impact to any park resource or value may constitute an impairment. Impairment may result from National Park Service activities in managing the park, from visitor activities, or from activities undertaken by concessionaires, contractors, and others operating in the park. Impairment of park resources can also occur from activities occurring outside park boundaries. An impact would be more likely to constitute an impairment to the extent that it has a major or severe adverse effect upon a resource or value whose conservation is:

- Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- Key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or
- Identified as a goal in the park's general management plan or other relevant National Park Service planning documents.

An impairment determination is included in the impact analysis section for all impact topics relating to park resources and values (i.e. soils and geology, vegetation, wildlife, and historic structures/cultural landscapes).

Natural Resources

Geology and Soils

Affected Environment

Site 1 Point Lookout Walls. In this area the road is built along a steep slope in the Cortez Member of the Mancos Shale Formation. The Cortez member is relatively uniform in structure, being pure shale with minor bentonite beds. About a hundred feet below this area, workers were required to use dynamite to cut through a 2-foot thick limestone layer during the original construction during the 1920's.

The soil above and below the Point Lookout Walls area is high in clay and salts, resulting in poor growing conditions for many plants. A few species of forbs, however, are adapted to the soils and these can produce an adequate ground cover. A remnant terrace of landslide material runs along the slope above this area. This terrace is made of gravels and boulders of Point Lookout Sandstone, intermixed with Mancos Shale. Tongues of this material spill down two ridges along the Big Hill roadway and these locations support a plant community that is quite different than the pure shale slopes.

Fossils in the area are minimal, as would be expected in the Cortez Member. The most notable is the giant clam that has been observed along a thin bed near Mile 2.

Site 2 - Horseshoe Bend. This site is at the base of the Point Lookout Sandstone where thin intermittent beds of sandstone and shale grade into the massive Mancos Shale Formation. Above and to the west of the road curve there is a massive Point Lookout Sandstone layer. Overlying the massive bed there is a thin layer of remnant bentonitic and concretionary Menefee Shale. The Horseshoe Bend roadway was originally resting on stable, non-slumping, non-swelling beds of lower Point Lookout Sandstone. However, when road reconstruction occurred in 1988, fill dirt from B-Cut and D-Cut was placed in this curve, pulling the road eastward from a more extreme curve. This fill was dumped here and fell to a steep angle of repose. Over the years the angle of repose could not be sustained. Over the last fifteen years the steep gradient has experienced minor slumping toward the bottom of Prater Canyon as the sandstone blocks decomposed.

The soil within the apex of the curve is imported fill and is a mixture of Cliffhouse Sandstone and Menefee Shale. Therefore, it contains some sandy soil but mostly clay and bentonite components. The lateral stems of the curve cut into the Point Lookout Sandstone, which generally is stable. The Point Lookout Sandstone substrate accounts for a special plant community that will be discussed below. This soil supports several unusual species that require neutral pH and sandy texture.

No fossils have been collected from the Point Lookout Sandstone in this location. However, a site one mile to the northeast has yielded fossil remains of palm leaves, ghost shrimp, and large clams.

Site 3 - Line Change. In terms of geology, the Line Change is a very interesting area. The road cuts through a large sandstone member of the Menefee Shale Formation here. This sandstone is overlain by carbonaceous shale that contains leaves of palm trees, laurel, and other prehistoric

deciduous trees. The park also has found fossiliferous remains of what may be a paleoaster, a rare early progenitor of poppies. Another carbonaceous layer below the sandstone contains fragments of poorly petrified wood and jet as well. Jet is a type of coal that was carved into effigies and other shapes by the Ancestral Puebloans. This area is one of two known outcrops of jet in the park.

The soil here is greatly influenced by thick layers of bentonite intermixed with shale. It is this bentonite that is responsible for slumping here in this entire raised landform and to the northeast. The park has suffered with a series of road slumps since the 1930's and engineers have attempted to re-route the road three times but they continually encounter the bentonite. Where the bentonite is fairly pure, a specific plant community grows but the plant cover is quit sparse. Another layer of interest here is a 12-inch thick paleosol layer, gray, brittle, and very hard. An excellent outcrop of this rare material occurs about 1,500 feet to the south.

Site 4 - B-Cut Westerly. B-Cut slices through Menefee Shale, which includes a thin sandstone layer, several shale layers, and a thin coal bed. The ridge running to the south of B-Cut is capped by thinly bedded Cliffhouse Sandstone. The canyon head where the waste dirt would be deposited has an alluvial bottom over Menefee Shale. Point Lookout Sandstone can be seen about two hundred feet down on the North Escarpment and below this is about 1,500 feet of Mancos Shale. Because of the two thick layers of shale, Menefee and Mancos, the entire North Escarpment is relatively unstable. The shale is non-consolidated and has intermittent layers of swelling and shrinking bentonite (a very fine clay layer that forms a barrier to groundwater flow). Attempts to run a road across the face of the escarpment has led to slumping below the road and continual cracking of the road surface. In addition, the slope above the road continually sheds rocks and loose shale down into the roadbed.

The soils on the escarpment are clay to clay loam, except on the ridge top where the soils are sandy loam. Small slump pools often are formed that may hold water year-around. This captured water and the steep north-facing slope allows for an upper montane plant community. The soils in the canyon bottom are alluvial loam and they generally support a rich grass-forb plant community. Drainage ditches along the inner shoulder of the park road feed snow melt to pools in the eastern head of School Section Canyon. Wildlife frequently visit these pools when water is available.

No fossils have been collected from B-Cut or the immediate area.

Effects of Alternative A, the No Action Alternative. The no action alternative would not result in any change to existing geology or soils conditions along the road.

Cumulative Effects

Past, present and future development within Mesa Verde National Park and the surrounding region has contributed to increased soil erosion and compaction, with minor to moderate adverse, long-term cumulative impacts. However, because there are no new impacts associated with this alternative, it would not contribute to impacts of other actions.

Conclusion
There would be no effect on geology or soils as result of the no action alternative. However, emergency repairs in the event of sudden catastrophic failures would result in site-specific alterations to the road corridor that could have locally minor long-term impacts to soils at that site.

The no action alternative would not produce major adverse impacts on these resources whose conservation are (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of geologic or soil resources or values as a result of the implementation of the no action alternative.

Effects of Alternative B, the Preferred Alternative

Site 1 - Point Lookout Walls. At Point Lookout 0.1 acre of new disturbance to soils would occur as a result excavation for wall construction. This would be a negligible, short-term adverse impact to soils and geology since a very small area would be impacted.

Site 2 - Horseshoe Bend. The amount of new soil disturbance at Horseshoe Bend would be 1.5 acres most of this from the shifting of the road to the south. No soils would be removed from this site. This would be no impact to soils and geology.

Site 3 - Line Change. The removal of the pull-out at line change would result in a negligible, short-term, adverse impact of 0.2 acres of new disturbance of soil.

Site 4 - B-Cut Westerly. Most of the impact from this project would take place at B-Cut Westerly. There would be a total of 7.6 acres of new disturbance, 3.6 acres resulting from the new cut and 4.0 acres as a result of fill for the new parking area. This would result in a minor, long-term, adverse impact to soils as a result of some soil loss due to localized erosion, soil compaction and excavation. However, after revegetation takes place, erosion loss would be minimized.

Cumulative Effects

Past, present and planned development within Mesa Verde National Park and the surrounding region has and would contribute to increased soil erosion and compaction as a result of construction and development, with negligible to minor adverse, long-term impacts. The overall cumulative impact with this project would remain the same since the effect of this project to geology and soil is very small and negligible in a regional context.

Conclusion

Alternative B would have a negligible to minor long-term adverse effect on the geology and soils of the park with 9.4 acres of new disturbance. Much of the areas that would be affected by soil cut and fill as a result of Alternative B is in degraded condition as a result of previous road construction or rehabilitation and/or its close proximity to the road.

Alternative B would not produce major adverse impacts on geologic or soil resources or values whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of these resources or values as a result of the implementation of Alternative B.

Main Entrance Road
Quantities of Disturbance

Location	Point Lookout	Horseshoe Bend	Line Change	B-Cut Westerly	Total for all Locations
Total New Disturbance (Acres)	0.116	1.462	0.220	7.643	9.442
New Disturbance in Areas of Cut (Acres)	0.093	1.228	0.220	3.669	5.211
New Disturbance in Areas of Fill (Acres)	0.023	0.234	0.000	3.974	4.232
Quantity of Excavation (Cubic Yards)	5,047	4,535	880	122,246	132,708
Quantity of Embankment (Cubic Yards)	398	7,573	64	116,962	124,997

Vegetation

Affected Environment

Site 1 Point Lookout Walls. The clay slope adjacent to the Point Lookout Wall area has been disturbed and cut to 80 degree slopes during road construction and road maintenance in previous years. Surprisingly there are three pioneering native plants that can grow on these inhospitable slopes. One is the beautiful magenta flowered Hayden's gilia, one is the shale thistle, and the other is the hardy many-flowered blazing star. They are found only on clay soils. Another

plant that thrives here is the perennial blueleaf aster, which spreads over slightly stable clay slopes during wet years. There is little in the way of native grasses that grow on this clay. The exception is the salina wildrye, a large bunch grass that attains four-foot heights during wet years. Indian ricegrass may be found in small patches. Following former roadwork, slender wheatgrass, intermediate wheatgrass, thickspike wheatgrass and smooth brome were planted to hold the surface soil in place. Smooth brome has spread over the entire Big Hill slope but it is patchy and is generally crowded out by blue leafed aster.

The steep, south-facing slopes on clay ridges grow another set of plants. This includes bushy buckwheat, four-winged saltbush, splendid phacelia, and annual buckwheat. Again, these species are found primarily on the Mancos Shale. The buckwheat and the saltbush here probably are very old, maybe centuries old. The plants are sparsely spaced and reproduction is rarely seen. The two annuals show up only during years of good snow cover and good spring precipitation.

Another plant that occurs here is the wild hollyhock. In modern times the only Colorado records of this plant is in Mesa Verde National Park. Wild hollyhock grows on the landslide terrace and on Mancos Shale. We know of only four small populations in the park. The largest population is in the head of the sagebrush valley southeast and below this area. The other three populations are within a quarter mile of the area. This hollyhock, however, is not a listed species.

Over 80 acres on the Big Hill slope have been disturbed by roadwork, over and over during the past 70 years. This has disrupted any semblance of natural plant succession. Revegetation has been minimal in terms of area planted, native species diversity, and success in construction prior to 2000. However, new methods of revegetation are improving the success. It is not surprising that revegetation efforts have had only limited success when we are dealing with very steep slopes and tight clay soils with high salt content.

Where areas have not been disturbed for two or three decades, some shrubs and trees have seeded in naturally in a sparse dispersal. These include pinyon pine, Douglas-fir, Utah serviceberry, Utah juniper, and mountain mahogany. As mentioned above, the landslide terrace has a good cover of pinyon pine, mountain mahogany, and some ground cover, including Oregon grape, rock goldenrod, goldeneye, slender buckwheat, squirreltail bottlebrush grass, muttongrass, and Indian ricegrass.

In addition to the introduced grasses, non-native plants in the area include Canada thistle in sparse patches along little drainages, sparse musk thistle, and rarely Siberian elm, tamarisk, and Russian olive. These three trees usually come in only where there is a seep or where water is concentrated into a drainage.

Site 2 - Horseshoe Bend. The vegetation in this area primarily is composed of mountain shrub complex with a few groves of relatively young Douglas-fir trees. The overall mountain shrub community here would have been considered as old-growth before the Bircher Fire in 2000. Now it consists of resprouting shrubs and herbs. The Douglas-fir trees here were from 80 to 200 years old and grew in dense stands on north facing aspects and in swales. Most of these trees were killed in 2000. Surviving Douglas-fir and ponderosa pine are important species that would be protected during construction. In Mesa Verde National Park about a third of the 50 or so ponderosa pine stands occur on Point Lookout Sandstone. A small stand of ponderosa pines was on the sandstone bench just south of Horseshoe Bend. In 2000 all but four of the 28 trees on this

bench were destroyed by fire. Other species of interest here are mountain muhly grass, cutleaf bahia, New Jersey tea, and cutleaf ragweed. All of these plants are quite rare in the park and each species is limited to two or three known sites in the park. Another item of interest here is a stand of old-growth pinyon pine trees. These trees, about a dozen in all, survived the Bircher Fire due to barren bedrock outcrops that acted as firebreaks. They are located outside the project area.

The onsite vegetation in the drainage head primarily is the result of revegetation and topsoil replacement that occurred following the 1988 road construction. Species include rubber rabbitbrush, blueleaf aster, snowberry, penstemon, and Woods rose. The same is true for the steep slope below the road in the apex of the curve. Mountain shrub grows below the lateral stems of Horseshoe Bend. The vegetation in the canyon bottom, at the base of the slope, is comprised of native grass and forb species in a meadow with a smattering of black currant and snowberry. Chokecherry stands grow at the base of the drainage. Generally the area is quite lush. Several of the species of brush in this area produce fruits or nuts that attracts birds and mammals.

Musk thistle is the most commonly expected non-native forb for this area. Occasionally bindweed will grow along the roadside here but it does not spread. Canada thistle and smooth brome also are noxious weeds at this site.

Site 3 – Line Change. Mountain shrub complex is the prevalent plant community in all directions around the Line Change. A few scattered Douglas-fir trees grow in the area and four stands of ponderosa were found within a quarter mile prior to the Bircher Fire of 2000. One unusual ground plant grows on the edge of the pullout where construction would occur. This is Virginia's ground cherry, *Physalis virginiana*, a species that has been observed only here and at two other park locations. The most interesting plant here is the fritillary lily, *Fritillaria atropurpurea,* which is recorded from a site less than a hundred yards to the south. This location has been thoroughly surveyed three different years and only one plant of this lily can be found.

Within a quarter mile to the east in the Line Change drainage, another unusual plant community thrives. This is the largest aspen grove to be found on the Mesa Verde cuesta. Here the understory consists of grasses, elk sedge, American vetch, golden banner, corral root orchid, and, since the Bircher Fire, large stands of fireweed. Before the fire, the availablity of aspen snags accounted for an abundance of cavity nesting birds. This is an atypical area to be found in Mesa Verde.

Site 4 - B-Cut Westerly. A relatively uncommon Douglas-fir community typifies the plant community on the escarpment, above and below the road. Associated with the Douglas-fir, we find Bigtooth maple. This is the only stand of these trees known in Colorado. The stand of Bigtooth maple extends from above the Point Lookout Sandstone cliffs and up to the park road, across the face of the rincon, and even a few trees are found in the western head of School Section Canyon where they mix with Gambel oak. On the escarpment grow small stands of acuminate cottonwood trees (a hybrid of narrowleaf and Fremont cottonwoods) and Rocky Mountain maple growing among the slump pools here. The understory also is quite atypical for Mesa Verde, having trailing clematis, sweet cicely, fireweed, elk sedge, meadow rue, cutleaf biscuitroot, and other upper montane species. Three small stands of ponderosa pine were found here and farther south. These stands were entirely killed during the Bircher Fire of 2000.

The plant community on the ridge top is quite different. Growing here is the mountain shrub complex, consisting primarily of Utah serviceberry, snowberry, rock fendlerbush, mountain mahogany, and Gambel oak. The understory is junegrass, squirreltail grass, rock goldenrod, sego lily, spurred lupine, and others. This is a completely different species composition from the Douglas-fir community.

The third plant community to be considered in this project site is the canyon head meadow where grasses cover over 50 percent of the site. These are junegrass, squirreltail, muttongrass, western wheatgrass, and needle-and-thread grass. Associated forbs are spurred lupine, sulfur flower, trailing fleabane, slender buckwheat, and wormwood.

Effects of Alternative A, the No Action Alternative. The no action alternative would not result in any change to existing vegetative conditions along the road corridor. The amount of non-native and invasive, alien plant species would not change.

Cumulative Effects

Past, present and future development within Mesa Verde National Park and the surrounding region has contributed to increased vegetation impacts from the growth of development, with minor to moderate adverse, long-term impacts. However, because there are no new impacts associated with this alternative, it would not contribute to the cumulative impacts of these other actions.

Conclusion

There would be no direct effects on vegetation as a result of alternative A. However, emergency repairs in the event of sudden catastrophic failures would result in site-specific alterations to the road corridor that could have locally minor to moderate long-term impacts to vegetation.

The no action alternative would not produce major adverse impacts on vegetation resources or values whose conservation are (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of vegetation resources or values as a result of the implementation of the no action alternative.

Effects of Alternative B, the Preferred Alternative

Site 1 - Point Lookout Walls. At Point Lookout only about 0.1 acre of new disturbance would be affected by vegetation removal and compaction as a result of construction of the retaining walls. With such a small area of native vegetation being affected, this would be a negligible, short-term, adverse impact to vegetation at this site.

Site 2 - Horseshoe Bend. At Horseshoe Bend there would be 1.5 acres of new disturbance from vegetation removal, most of this from the shifting of the road to the south. This small amount of clearing would result in a negligible to minor, long-term, adverse impact to vegetation, most of it being the new shrubs and herbs adjacent to the current road.

Site 3 - Line Change. The removal of the pull-out at line change would result in a negligible, short-term, adverse impact of 0.2 acres of new disturbance. Very little of this area is vegetated. Care would be taken to protect the aspen grove located below the pullout to prevent material from spilling down slope.

Site 4 - B-Cut Westerly. In this area a total of 7.6 acres of new disturbance (3.6 acres resulting from the new cut and 4.0 acres as a result of fill for the new parking area) would result in minor long-term, adverse impact to the vegetation. Sensitive plant areas (including the big toothed maple) have been identified and would be avoided during construction. After mitigation efforts, including revegetation and week control, there would be partial recovery of native the vegetation at this site.

Cumulative Effects

Cumulatively, Alternative B in combination with past, present and planned development within Mesa Verde National Park and the surrounding region would result in minor to moderate adverse, long-term impacts from continued growth and development in the region. The adverse impacts of this preferred alternative would be a minor component of the overall cumulative impact of other development actions in the region.

Conclusion

Overall, Alternative B would have negligible to minor adverse effects on the vegetation in the park with 9.4 acres of new disturbance. Much of the areas that would be affected by disturbance as a result of Alternative B is in degraded condition as a result of previous road construction or rehabilitation and/or its close proximity to the road.

Alternative B would not produce major adverse impacts on vegetative resources or values whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of these resources or values as a result of the implementation of Alternative B.

Wildlife

Affected Environment

Site 1 Point Lookout Walls. There is more wildlife in the Big Hill area than one would expect when looking at the rather barren clay slopes. The diversity is due to the high terrace and its productive habitat. Also the brushy ridges are favorable to some species. The salina wildrye slopes support woodrats and several species of mice, which subsequently sustains an unusually high number of rattlesnakes. This verifies the productivity of this hardy bunchgrass that greens in the spring and again after the summer rains and produces large seeds favored by rodents.

White-throated swifts and violet-green swallows feed along the cliffs and barren slopes under

Point Lookout. Northern saw-whet owls, spotted towhees, and black-headed grosbeaks are known to use the brushy ridges. A great horned owl has answered calls from the base of the Big Hill slope. Common poorwills are seen frequently at night along the road here. Red-tailed hawk and a golden eagle have been known to nest in nearby cliffs. Peregrine falcons hunt in this area, but do not nest close by. Wild turkeys roost in the Douglas-fir trees on the high terrace. Rock wrens nest on the rocky clay slopes below the terrace.

Elk live in the sagebrush valleys at the base of the Big Hill slope and occasionally they move across Mile 2 to access the base of the North Escarpment. Mule deer commonly are seen climbing the shale slopes as they access the high terrace and other areas. Bobcat and gray foxes have been seen here regularly for many years. Weasels, chipmunks, and rock squirrels are other common small mammals of this area. The most common inhabitant is the deer mouse, which is especially abundant along the high terrace.

In addition to rattlesnakes on the steep shale slopes, a survey of the high terrace showed an unusually high population of plateau lizards here. Short-horned lizards live on top of Point Lookout and at the base of the Big Hill slope. In both cases they seek out barren openings where they eat ants, beetles, and other insects. Historically tiger salamanders lived in pools on the terrace. Certain butterflies patrol ridges as their mating territory. This occurs on the shale ridges below the Sawdust Fill Site. A colony of honey bees have been found living in the eroded hollows of a clay drainage on the steep slope below the road.

Site 2 - Horseshoe Bend. Before the 2000 fire, a pair of great horned owls nested on the ridge top west of Horseshoe Bend. The nest was built in a very large, old pinyon pine tree. Spotted towhees, black-headed grosbeaks, blue grouse, black-chinned hummingbirds, Virginia's warblers, and ducky flycatchers are common in the mountain shrub here. During some years the Townsend's solitaires nest at the slope base. Common poorwills and flammulated owls feed in this area at night, probably catching flying insects that are swept up the canyon by updrafts.

All of the park's large and mid-sized carnivores are known to use this area including gray fox, coyote, black bear, bobcat, and mountain lion. Pine marten were seen in this area infrequently before the fire that destroyed most of the Douglas-fir, thereby eliminating most, if not all, of the red squirrels upon which they feed. Cottontail rabbits, long-tailed weasels, mule deer, yellow-bellied marmots, and golden-mantled ground squirrels also live here. One year in the early 1990's a female black bear used the Horseshoe Bend culvert as a denning site. In early April the bear waded out over the remaining snow patch at the culvert head and feasted on the fast growing smooth brome at the head of the Horseshoe Bend.

An unusual spider lives in colonies on the slopes of the south lateral stem of the curve. This spider builds irregular webs among the blue-leafed aster, where the spider stretches out longitudinally, camouflaging with the web, and awaits its prey. Any disturbance causes the spider to retract its legs and drop to the ground where it hides.

Site 3 – Line Change. There are four attributes that stand out about wildlife in the Line Change area. One species is yellow-bellied marmot, which live in the boulder pile below the road. Another species is the golden eagles that frequently soar over Chickaree Point, the high North Rim point directly above the Line Change site. A third species of special interest here, at least before the fire, are the "chickarees" or red squirrels that live in the small, scattered stands of

Douglas-fir. The fourth item of interest is the chorus of birds that live here, especially those that nest in the aspen grove. Among birds that have been observed nesting here are hairy woodpeckers, broad-tailed hummingbirds, western tanagers, yellow-rumped warblers, Virginia's warblers, dusky flycatchers, olive-sided flycatchers, violet-green swallows, black-headed grosbeaks, and an occasional hermit thrush. Most unusual was a record of an indigo bunting that was seen one year singing from the top of a Douglas-fir tree here. Elk, mule deer, black bear, and mountain lion also have been recorded in the area. The black bears feed on the rare slender sunflower rhizomes that grow to the north. They also concentrate on chokecherry and oak patches during the fruit/acorn season and they bed down below Chickaree Canyon during the day.

Site 4 - B-Cut Westerly. The B-Cut rincon provides a special set of conditions that affect the faunal habitat. Due to the cool northern exposure, the surface water, and the Douglas-fir community, there are several interesting faunal species here that are not found much in adjacent areas. This is exemplified in birds, mammals, and probably in reptiles and invertebrates. Birds that congregate and nest in this relatively small area are western tanager, yellow-rumped warbler, olive-sided flycatcher, Clark's nutcracker, and warbling vireo. Violet-green swallows and white-throated swifts also congregate here, but they come here to feed on insects that are funneled in by updrafts or attracted to the pooled water. Because flying insects are swept up the canyons by thermals and up the North Escarpment by updrafts, it also is likely that bats, just like the birds, find this an exceptional feeding site. Also there is a higher than normal number of owl records from this portion of the North Rim. These records include several of long-eared owl, great horned owl, flammulated owl, and northern pigmy-owl. Mammals of particular interest here include the red squirrel, which utilizes the Douglas-fir seeds as food and the tall, densely limbed trees for nest sites and escape cover. In the park, red squirrels are found only in Douglas-fir groves and, since the year 2000's fires, perhaps less than 200 acres of live Douglas-fir remain. Yellow-bellied marmots, another rare species in the park, live in a rocky outcrop a quarter mile to the east on the rim of the North Escarpment.

The ridge top above B-Cut is known to be used by hunting and perching raptors, including hawks, golden eagles, and long-eared owls. The ridge top and upper portions of the cut face are favorite day bed ground for mule deer and elk. These ungulates find this steep slope favorable due to the good visibility in all directions for better detecting predators. Another faunal species of interest is the glow worm, which can be observed along the North Rim, often on high points such as the B-Cut ridge. At night the winged male signals a yellow light to the wingless female, usually in July.

Wildlife in the canyon head meadow includes the Mexican vole and Merriam's shrew, both species of park concern. The Mexican vole is a Pleistocene relic and remains on a few high elevation land forms. Wild turkeys also nest and feed here on seeds and insects such as grasshoppers. Mule deer, elk, and bear are seen here occasionally. These canyon head meadows are known to be very productive because they have excellent soil and also have a concentration of soil moisture. These meadows generally are small, running a quarter mile to a mile down the narrow canyons. In terms of biomass production and species diversity, the canyon head meadows have more to offer than any other habitat-type in the park.

Effects of Alternative A, the No Action Alternative. The no action alternative would not result

in any change to existing wildlife populations or habitat along the road corridor.

Cumulative Effects

Past, present and future development within Mesa Verde National Park and the surrounding region has contributed to increased wildlife impacts, with minor to moderate adverse, long-term impacts. However, because there are no new impacts associated with this alternative, it would not contribute to impacts of other actions. Consequently there would be no cumulative impacts under the no action alternative.

Conclusion

There would be no change to wildlife population or habitat as a result of alternative A.

The no action alternative would not produce major adverse impacts on vegetation resources or values whose conservation are (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of wildlife resources or values as a result of the implementation of the no action alternative.

Effects of Alternative B, the Preferred Alternative

Alternative B would directly permanently affect approximately 9.4 acres of wildlife habitat, the majority (7.6 acres) at B-Cut Westerly. This area would be removed from wildlife habitat by the road rehabilitation. There would be minor short-term adverse impacts to wildlife habitat adjacent to the project area during construction activities. In addition, there also would be possible direct mortality of small mammals and reptiles from this construction activity. Minor short-term adverse effects to wildlife may include a reduction in quality of adjacent habitat and avoidance of these habitats during construction. Populations of those species affected by construction would not be adversely affected in the long term due to the limited habitat affected and number of individuals actually impacted by this alternative.

Cumulative Effects

Cumulatively, Alternative B in combination with past, present and planned development such as the planned redevelopment of Wetherill Mesa, the planned cultural center and other project in the surrounding region would result in minor, adverse, long-term impacts to wildlife resources. The adverse impacts of this preferred alternative would be a minor component of the overall cumulative impact of other actions in the region.

Conclusion

Alterative B would have a minor short-term and long-term adverse effect on the wildlife along the road corridor.

Alternative B would not produce major adverse impacts on wildlife resources or values whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of

the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of these resources or values as a result of the implementation of Alternative B.

Cultural Resources

Historic Structures/Cultural Landscapes

This section presents a description of the cultural landscapes and historic structures affected by this project and the evaluation of effects to those resources.

Affected Environment

According to the National Park Service's *Cultural Resource Management Guidline* (DO-28), a cultural landscape is a reflection of human adaptation to the land and often is expressed in the way land is organized, patterns of settlement, land use, systems of circulation and transportation and the types and locations of buildings, structures, parks and open space that are present. The NPS recognizes four types of cultural landscapes: *historic designed landscapes, historic vernacular landscapes, historic sites* and *ethnographic landscapes*. The Entrance Road at Mesa Verde National Park is considered an *historic designed landscape,* defined in DO-28 as, "a deliberate artistic creation reflecting recognized styles and/or landscapes associated with important persons, trends or events in the history of landscape architecture."

Historic American Engineering Record (HAER) document number CO-79 states that the Entrance Road is "arguably the predominant designed feature of the park's master plan (HAER, 1994)." Not only is the current road alignment virtually unchanged from the 1926 survey, it also closely approximates the original wagon route of 1907. The alignment of the Entrance Road was surveyed in 1926 and road surfacing, including the extension of the Entrance Road between the north boundary and Highway 160, began in 1931 with involvement from the Civilian Conservation Corps (CCC). Moreover, the decision to extend the road north to Highway 160 and the subsequent decision to pave the road ensured that the North-South Highway (historic name for the Entrance Road) would remain the main entrance to the park.

With guidance from landscape architects Thomas Vint and Merel Sager, Park Superintendent, Jesse Nusbaum, quickly grasped the importance of preserving scenic overlooks and the value of carefully reviewing construction plans in order to ensure the maximum aesthetic value of roadway design. Additionally, the CCC had a great role in shaping the current aesthetic of the road. Their work included obliterating old roads and reclaiming them, rounding slopes and planting vegetation. Both early visionaries and the CCC had a great impact in creating significant features of the Entrance Road and their work affected the four project sites included in this Environmental Assessment (EA).

The four project sites included in this EA are described below in terms of their history and significance.

Site 1 - Point Lookout Walls. This portion of the road was constructed between 1927 and 1929

and was called the Point Lookout Grade East. The eastern side of Point Lookout was thought to be more stable than the western side. Point Lookout Grade West went around the front of Point Lookout to the west and then into the head of Morefield Canyon. Although Point Lookout Grade West gave amazing views of the Montezuma Valley, Point Lookout Grade East gives drivers a beautiful look at the Mancos Valley and La Plata Mountains. This long and vast view of the surrounding, dramatic landscape is a significant part of the road character. Moreover, Point Lookout forms one of the highest elevations in the park and clearly dominates the landscape as a highly recognizable natural landmark.

When defining the affected environment for this area, one must not only consider the views from the road, but also the views to the road. As one drives toward the west from Mancos, the view of Point Lookout is of a spectacular cuesta, which rises some 2,000 feet above the valley floor (Shapins, 2002) and visually dominates the landscape. Additionally, the road and existing tie back walls on Point Lookout Grade East are very visible - the industrial looking, man-made elements stand-out as they cut through a "natural landscape."



Point Lookout taken from U.S. Hwy. 160 looking southwest (2000). Point Lookout Grade East is visible on the left side of Point Lookout.

Site 2 - Horseshoe Bend. This small portion of road was once located approximately 100 feet (visible from road scars) higher on the slope than its present location. The original alignment was established from 1908 to 1914 and then was moved downslope between 1986 and 1987.

Site 3 – Line Change. The original alignment was established between 1908 and 1914. The current alignment was constructed in 1925 when B-Cut was constructed. The pullout at Line

Change may or may not have been part of the current alignment when it was constructed in 1925.

Site 4 - B-Cut Westerly. Both B-Cut Westerly and B-Cut Easterly were constructed in 1925 and replaced two portions of road that wrapped around the southern part of the two hills through which B-Cut was constructed (thus the "Cut"). B-Cut Easterly was abandoned sometime between 1931 and 1957, while B-Cut Westerly is still used and is called, "B-Cut". Over time, the cut above the road has been shaved back to avoid rocks and debris in the road, but its shape is very close to the shape it held just after construction in 1925. Bravo or B-Cut and Delta or D-Cut derive their names from the shape, as one looks down on the site from above (perhaps in a plane – plan view), that they create. One of the cuts looks like a B in plan view and the other like a D in plan view.

B-Cut does contain one contributing feature: an 80 foot stone retaining wall located on the fill or north side of the road. The construction of this wall is not documented and therefore, its construction date is unknown. Its appearance is similar to the other work done on the road by the CCC, such as the stone headwalls, and it is possible that this is CCC work.

The historic road has been documented (HAER, 1994) and is considered eligible for listing on the National Register of Historic Places, both individually and as a contributing element to a historic designed landscape. Park staff is in the process of conducting a Level II Cultural Landscape Inventory (CLI) of the road.

Effects of Alternative A, the No Action Alternative

Alternative A would result in no modifications or alterations to the road. Therefore, the No Action Alternative would have no known short or long-term, or cumulative effect on the road. However, emergency repairs in the event of sudden catastrophic failures would result in site-specific alterations to the road corridor that could have locally minor to moderate long-term impacts to the cultural landscape.

Cumulative Effect

Past projects affecting and most often degrading the integrity of the road include:

- demolishing the Entrance circulation, signs and entrance station in 1954 and then reconfiguring the circulation, constructing new, more modern signs and placing two new entrance kiosks;
- removal of stone curbing throughout the length of the road;
- abandonment of the Knife Edge portion of the road in 1958;
- removal of the concrete and cable guardrails in the 1960s;
- realignments such as at Line Change/B-Cut Easterly, mile 8.6 and 8.9;
- widening of the road which has occurred several times over the almost 70 years since formal master planning was instituted in regard to the road;
- Reconstruction of the Boulder's Nest at approximately milepost 3.0.
- Repair of a massive landslide on Point Lookout road at mp 2.5-3.0 in 1984

Future and ongoing projects and plans include perpetual future repairs to the Entrance Road, complete rebuild of the Wetherill Road, development of new facilities at Wetherill Mesa, a new

Cultural Center, a Transportation Plan, redevelopment of the Lodge at Far View, and the Fire Management Plan. These projects would be designed to protect and blend with historic architecture and provide appropriate visitor experiences. In conjunction with other planned activities, the no action alternative would result in beneficial long-term, cumulative effect. The no action alternative would be a small component of this cumulative effect, unless the road fails in which case the impact component could be adverse and moderate.

Conclusion

Alternative A would result in no modifications or alterations to the road. Therefore, the No Action Alternative would have no known short or long-term, or cumulative effect on the road.

Effects of Alternative B, the Preferred Alternative

The following discussion evaluates the effects of the preferred alternative on the Entrance Road.

Site 1 - Point Lookout Wall. Alternative B requires construction of 13,000 square feet of tie back retaining walls along the Point Lookout Grade East. Similar walls currently exist at this location and these walls cause a visual obstruction as one drives west on Highway 160 from Mancos. Construction of these new walls would result in the removal of natural features such as vegetation, soil and rock. The "tie back" walls have a stark, rigid character in contrast to the surrounding natural area, which causes them to be easily visible from points far in the distance.

Mitigation of the negative impacts of this alternative would include:

- construction of walls that allow for plant growth over the top of the wall
- walls that step down the slope such as a terrace. (This would help to avoid the steep vertical scar one sees with walls that are very tall.)

Site 2 - Horseshoe Bend. In order to stabilize the road bed and provide a flatter road bed, this portion of road would be realigned by moving it approximately 37 feet to the west. This would require a reclamation of the current roadbed and allow for the fill slope to be flatter. The fill slope would be recontoured approximately 150 feet down the slope. This would require the destruction of the current vegetation in order to recontour. The slope would subsequently be revegetated.

This action would impact several elements of the cultural landscape: new road alignment, vegetation and views to and from Horseshoe Bend. The new road alignment would bring Horseshoe Bend slightly closer to its original alignment thus providing a minor beneficial impact. Revegetation at Mesa Verde has a varied history and the success rates are quite low. Depending on the success rate of this revegetation effort, the impact to the cultural landscape is considered negligible to moderate adverse.

The views from Horseshoe Bend would not change dramatically if the alignment is changed, however the view to Horseshoe Bend would be quite different for a period of time as vegetation

recovers. Depending on the success of the growth of the vegetation, the impact to the landscape regarding the views would be negligible to moderate adverse.

The overall impact to Horseshoe Bend from the work to be done in Alternative B is minor adverse due to the unpredictable nature of vegetation recovery at Mesa Verde.

Site 3 - Line Change. Alternative B specifies removing the pullout at Line Change. There is no evidence showing that this pullout was part of the original design of Line Change. Mesa Verde National Park staff have stated that the pullout developed over time as debris, from the cut side of the road, was dumped in this location creating a wider spot where this pullout was easily constructed. The slope below the pullout has little to no vegetation as this was used as a dumpsite for many years, thus preventing vegetation growth. Removing this pullout would not affect the integrity of this site and the impact to the cultural landscape is negligible.

Site 4 - B-Cut Westerly. Alternative B specifies realigning the road approximately 15 feet into the hillside, construction of a concrete rockfall ditch that is 11 feet wide, cutting B-Cut so that is has a compound slope: up to the coal seam at 2:1 (x:y) and above that at 3:1 (x:y). The cut material would be used to fill the head of a drainage just to the west of B-Cut. This fill material would be used to create a new parking area for people to stop. It also may be used as a parking area at a future trailhead. These changes affect several features of the road: feeling, view, materials, alignment, design and vegetation.

The 15-foot change in alignment would not affect the integrity of this road and the impact would be negligible. There will be no impact to the 80 foot stone retaining wall.

Changes to the height of the cut and the addition of a concrete ditch would change the feeling of this portion of road. Right now, the high cut on the southerly portion of the road focuses one's attention on the view to the Montezuma Valley. In reducing the height of the cut, views would open up to the south, east and west. This would not affect the integrity of the road and this impact would be negligible. The addition of the concrete ditch would add a more urban element and engineered feeling to a road that is rural in nature. This impact would be a minor adverse impact.

The creation of a compact slope at 3:1 on top would require the removal of a great amount of material and a significant amount of vegetation destruction. Revegetation at Mesa Verde has a varied history and the success rates due to climate and soils structures. Depending on the success rate of this revegetation effort, the impact to the cultural landscape is considered negligible to moderate adverse.

The addition of a parking area next to B-Cut would have a barely perceptible and not measurable impact on the road as a cultural landscape.

To mitigate the impact of the road repair work on the cultural landscape, one or more of the following mitigation measures would be implemented. These treatment measures are designed to mitigate adverse effects to historic properties (e.g., significant cultural resources). Possible mitigation measures include, but are not limited to, the following:

- Revegetated areas would be monitored for the success and possible unforeseen problems,

such as an insect infestation or drought leading to a low growth or success rate.

- The slope at B-Cut would be graded to produce a slope with undulations or a more "natural" look.

- Different types of retaining (tie-back) walls that allow for vegetation to grow over them.

- The 80 foot retaining wall would be avoided at B-Cut.

For the purposes of this analysis, short-term effects are limited to the period of construction. Implementation of Alternative B would have moderate short-term visual and audible (and perhaps atmospheric) effects on the National Register of Historic Places-character defining features (e.g., feeling, association, setting, design) of the Entrance Road. Short-term effects to the historic cultural landscape and the National Register of Historic Places-eligible road would constitute a minor and local adverse effect to these resources.

As noted above, implementation of Alternative B would result in long-term effects to the National Register of Historic Places-character defining features (e.g., feeling, association, setting, design) of both the historic cultural landscape and the Entrance Road. The alteration of the road as well as the introduction of visual and audible elements that are out of character with the historic properties would adversely effect the setting, feeling and association of these resources. The long-term effects would be local and would constitute a minor adverse effect to these resources.

Cumulative Effects

Cumulative effects result in the incremental effect of the action when coupled with other past, present and reasonably foreseeable future actions. Past projects affecting and most often degrading the integrity of the road include:

- demolishing the Entrance circulation, signs and entrance station in 1954 and then reconfiguring the circulation, constructing new, more modern signs and placing two new entrance kiosks;
- removal of stone curbing throughout the length of the road;
- abandonment of the Knife Edge portion of the road in 1958;
- removal of the concrete and cable guardrails in the 1960s;
- realignments such as at Line Change/B-Cut Easterly, mile 8.6 and 8.9;
- widening of the road which has occurred several times over the almost 70 years since formal master planning was instituted in regard to the road;
- Reconstruction of the Boulder's Nest at approximately milepost 3.0.
- Repair of a massive landslide on Point Lookout road at mp 2.5-3.0 in 1984

Future and ongoing projects and plans include perpetual future repairs to the Entrance Road, complete rebuild of the Wetherill Road, development of new facilities at Wetherill Mesa, a new Cultural Center, a Transportation Plan, new Interpretive Prospectus, a new Lodge at Far View, Fire Management Plan and a General Management Plan (GMP). These projects would be designed to protect and blend with historic architecture and provide appropriate visitor experiences. In conjunction with other planned activities, implementation of Alternative B

would result in cumulative effects that have not already been addressed as direct, short-term, and long-term effects.

Since the construction of the road in 1907 and more importantly since the road planning and design work done during the first Superintendency of Jesse Nusbaum during the 1920s, there has been a gradual loss of integrity and this would continue as more repair work and redesigning is done.

Conclusion

Implementation of Alternative B would result in minor, long-term adverse effects and minor short-term adverse effects to the Entrance Road. The treatment measures used to mitigate the long-term effects would be essentially the same as those to offset the short-term effects. Although construction of Alternative B would result in minor, long-term effects, the effects created by implementation of the proposed action would be less than under the No Action Alternative (assuming there are future road failures). Alternative B would not only result in less of a potential effect to the cultural landscape and road, but it also would provide for the greatest potential to mitigate any adverse effects. However, the cumulative effect of Alternative B and past and future plans is a minor to moderate adverse impact.

Alternative B would not produce major adverse impacts on cultural resources or values whose conservation is: (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the Park's GMP or other NPS planning documents. Consequently, there would be no impairment of cultural resources or values as a result of the implementation of Alternative B.

Section 106 Summary

After applying the Advisory Council on Historic Preservation's criteria of adverse effect (36 CFR Part 800.5, *Assessment of Adverse Effects),* the National Park Service concludes that implementation of the preferred alternative would have *no adverse effect* on the National Register of Historic Places eligible cultural landscape historic road.

Visitor Use and Experience

Affected Environment.

The Mesa Verde National Park interpretive staff works to facilitate a personal connection between each visitor and the cultural and natural resources of Mesa Verde. This connection, a better understanding of the ancestral Puebloan culture and the multi-cultural legacy of the early people, fosters a feeling of stewardship and support for the mission of the park and the National Park Service. Making this connection with the visitor helps to ensure that the park resources would be protected and preserved as the visitor becomes, in essence, a stakeholder as a result of the connection. This connection is one of the primary goals of the visitor experience.
After stopping at the entrance station and receiving general park information (i.e., map and brochure), visitors typically drive 15 miles to the Far View Visitor Center (summer) or 20 miles to

the Chapin Mesa Archeological Museum (year around). Conditions on the road from the entrance to the top of Chapin Mesa can be challenging, as the road is narrow, has steep grades, and sharp turns with limited sight lines.

Scenic views are afforded the visitor in numerous places in the park. The nature of the park's setting, namely high mesas overlooking wide expanses of the southwest region, provides spectacular scenery that is an important element of the experience that visitors seek at Mesa Verde. The 1931 amendment to the park's enabling legislation provides protection for "...the scenery along the Point Lookout Road (i.e., the Entrance Road)...", thus establishing the value of visual quality for the Mesa Verde visitor. Clear views of distant landmarks also are a part of the ancestral Puebloan experience that visitors should also experience.

Effects of Alternative A, the No Action Alternative.

Visitor experience under the no action alternative would not differ from current conditions as described in the Affected Environment section unless and when the road would close due to a failure. Then there would be a moderate or even a major impact to visitors depending on the severity of the failure and the amount of time the road would be closed for repair.

Cumulative Effects

Long-term, minor beneficial effects to visitor experience would be expected as planned projects within the park and region are completed. The no action alternative would add nothing to the cumulative effect to visitor experience and use unless the road fails. If the road would fail then the cumulative effect to the regional visitor experience would be adverse and minor to major depending on the severity of the failure and the amount of time to repair the road.

Conclusion

No action could result in a moderate adverse impact to the visitor experience if the road would close due to failure.

Effects of Alternative B, the Preferred Alternative.

During construction, vehicular traffic along the road would be temporarily restricted in the vicinity of construction activities. Traffic could be subjected to alternating, one-way flow. Every effort would be made to maintain the flow of vehicular traffic on the road during the construction period. Flaggers also could be used during work hours to control traffic. Any construction associated delays would be anticipated to be 5-15 minutes or less. All efforts would be made to reduce delays and closures as much as possible and alert park staff as soon as possible if delays longer than normal or closures are expected. Visitors stopping at the park's two visitor orientation areas would be informed of construction activities and associated delays. Equipment would not be stored along the roadway overnight without prior approval of part staff. Impacts would be adverse and intensity minor, but would be short-term in duration.

The long-term effect on visitor experience would be moderate and beneficial because of increased safety and road stability. Also, the greatly reduced risk of a large failure along the

entrance road, which would close the park, is a benefit to the park visitor.

Cumulative Effects

The major visitor destination in the region is the park. With the reduced risk of road failure as a result of the road improvement, the cumulative effect would be moderate and beneficial to visitors in the region since this project would reduce the risk of road failure.

Conclusion

Alternative B would have minor to moderate beneficial effects to the visitor experience. One of the primary reasons for road rehabilitation is to improve visitor safety and guarantee access. In the short-term there would be a minor adverse impact as a result of construction activity.

Park Operations

Affected Environment.

Not only does the entrance road provide access for the visitor but the park staff uses the road to reach all work sites located in the park. The parks' interpretive, resource and research, operations and administrative divisions are all centered on Chapin Mesa.

Currently the park spends a great amount of time maintaining and providing access to the areas along the entrance road. These efforts include scaling and clearing rock from the road and repairing cracks in the roadways.

Effects of Alternative A, the No Action Alternative

The no action alternative would have a minor, adverse, long-term effect on park staff. Park operation would continue routine maintenance along the roadway, but rock fall and road cracks would tend to slowly increase over time. As the roadway condition continues to deteriorate, the need for emergency repairs would likely increase and maintenance of the road would demand more park staff time and funds. This would be a minor to moderate long-term adverse effect on park operations. In the case of a road failure the impacts could be adverse and minor to major depending on the scale of the failure and the time required to repair the road.

Cumulative Effect of Alternative A, the No Action Alternative

With the planned transportation study, new cultural center and other planned park projects, efficiencies to park operations would contribute to a cumulative effect that would be minor to moderate, beneficial and long-term. If the road would fail, impacts to park staff could be minor to major and adverse.

Conclusion

The no action alternative would maintain the risk of possible road failure and the current level of

maintenance would continue to increase. This would lead to a minor to moderate adverse impact to park operations.

Effects of Alternative B, the Preferred Alternative.

The new road rehabilitation also would allow for more dependable and safer access for park employees to the park headquarters facilities on Chapin Mesa. This would result in a minor to moderate beneficial effect for park operations. Some adverse short-term (during construction) effects would result from increase in staff workloads for visitor management, delays of employees traveling on duty and commuting, and possible emergency response times being increased.

The service life of the park's main road would be extended by several decades, decrease cyclic maintenance requirements and reduce the risk of catastrophic failure. Thus, present impacts to park operations would be appreciably reduced due to decreased maintenance of the road resulting in a moderate, long-term, beneficial effect. Some minor to moderate adverse long-term effects on park operation would result from additional staff needs for reseeding, replanting, watering, weed control and erosion control.

Cumulative Effect of Alternative B, the Preferred Alternative

With the planned transportation study, new cultural center and other planned park projects, efficiencies to park operation would contribute to a cumulative effect that would be minor to moderate, beneficial and long-term. The preferred alternative would contribute a moderate level to this cumulative effect by decreasing the risk of road failure.

Conclusion

Park operation would be beneficially affected by the rehabilitation of the entrance road with a reduced level of effort required to maintain the road. This would be a minor to moderated long-term beneficial effect to park operations.

Compliance, Consultation/Coordination, References, Preparers and Appendix

Compliance

This EA provides disclosure of the planning and decision-making process and potential environmental consequences of the alternatives. The analysis of environmental consequences was prepared on the basis of a need to adequately analyze and understand the consequences of the impacts related to the proposed developments and to involve the public and other agencies in the decision-making process.

In implementing this proposal, the NPS would comply with all applicable laws and executive orders, including the following:

NEPA: The environmental analysis was prepared in accordance with the regulations of the Council on Environmental Policy Act (CEQ) (40 CFR 1500 et seq.) and in part 516 of the U.S. Department of the Interior's Departmental Manual (516 DM).

The National Environmental Policy Act (NEPA) is the basic national charter for environmental protection; among other actions it calls for an examination of the impacts on the components of affected ecosystems. The 1989 GMP, 2001 NPS *Management Policies*, DO-12 (*Conservation Planning, Environmental Impact Analysis and Decision Making*); and DO-77 (*Natural Resources Management*), among other NPS and park policies, provides general direction for the protection of the natural abundance and diversity of all the park's naturally occurring communities.

Various agencies have been contacted and consulted as part of this planning and environmental analysis effort. Appropriate federal, state, and local agencies have been contacted for input, review, and permitting in coordination with other legislative and executive requirements.

Special Status Species: Endangered Species Act of 1973, as amended (16 USC 1531 et seq.). Section 7 of the Endangered Species Act requires all federal agencies to consult with the U.S. Fish and Wildlife Service to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of listed species or critical habitats.

Cultural Resources: The NPS is mandated to preserve and protect its cultural resources through the Organic Act of August 25, 1916, and through specific legislation such as the Antiquities Act of 1906, the National Environmental Policy Act of 1969 (as amended), and the National Historic Preservation Act of 1966 (as amended), NPS *Management Policies 2001*, the *Cultural Resource Management Guideline* (DO-28), and the Advisory Council on Historic Preservation's implementing regulations regarding *Protection of Historic Properties* (36 CFR 800). Section 106 of the National Historic Preservation Act of 1966 requires that federal agencies having direct or indirect jurisdiction over undertakings consider the effect of those undertakings on properties on or eligible for listing on the National Register of Historic Places and afford the Advisory Council on Historic Preservation and the State Historic Preservation Office an opportunity to

comment.

In the unlikely event that human remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered during construction, construction would be halted. Consultation would be implemented with the 24 Native American tribes affiliated with Mesa Verde National Park. The park staff would follow the guidelines established for the Native American Graves Protection and Repatriation Act (NAGPRA) [Public Law No. 101-601; 25 USC Section 3001-3013; 104 Stat. 3048-3058] and its implementing regulations (43 CFR 10).

As construction occurs, an archeologist would monitor activities to assure that archeological resources are not impacted. If unknown buried deposits are located, documentation of the resources would occur. Construction would avoid impacting deposits whenever possible. However, in the unlikely event that impacts to previously unknown or known buried deposits are unavoidable, data recovery excavation may be undertaken. Data recovery efforts would be guided by the provisions of the 1966 National Historic Preservation Act, as amended in 1992 (16 USC 470); the Native American Graves Protection and Repatriation Act (1990), the Advisory Council regulations *Protection of Historic Properties 2000* (36 CFR Part 800), and NPS *Cultural Resource Management Guideline,* Release 5, 1997.

Consultation and Coordination

Agencies and Organizations

Agencies and Organizations contacted for information; or that assisted in identifying important issues, developing alternatives, or analyzing impacts; or that have been sent the EA for review and comment include:

Federal Agencies
Advisory Council on Historic Preservation
U.S. Department of the Interior - Fish and Wildlife Service
Federal Highways Administration

State Agencies
Colorado Historical Society (office of State Historic Preservation Officer)

American Indian Tribes and Pueblos

Consultations with the following 24 American Indian Tribes and Pueblos associated with the park occurred on September 5, 2001 and March 7, 2002:

- Hopi Tribe of Arizona
- Pueblo of Acoma, New Mexico
- Pueblo of Cochiti, New Mexico
- Pueblo of Isleta, New Mexico
- Pueblo of Jemez, New Mexico
- Pueblo of Laguna, New Mexico
- Pueblo of Nambe, New Mexico

- Pueblo of Picuris, New Mexico
- Pueblo of Pojoaque, New Mexico
- Pueblo of San Felipe, New Mexico
- Pueblo of San Ildefonso, New Mexico
- Pueblo of San Juan, New Mexico
- Pueblo of Sandia, New Mexico
- Pueblo of Santa Ana, New Mexico
- Pueblo of Santa Clara, New Mexico
- Pueblo of Santo Domingo, New Mexico
- Pueblo of Taos, New Mexico
- Pueblo of Tesuque, New Mexico
- Pueblo of Zia, New Mexico
- Navajo Nation of Arizona, New Mexico and Utah
- Southern Ute Tribe of the Southern Ute Reservation, Colorado
- Ute Mountain Ute Tribe of the Ute Mountain Reservation, Colorado, New Mexico and Utah
- Ysleta Del Sur Pueblo of Texas
- Zuni Tribe of the Zuni Reservation, New Mexico

Selected References

Executive Orders

Executive Order 11988 (Floodplain Management)
Executive Order 11990 (Protection of Wetlands)
Executive Order 12898 (Environmental Justice)

National Park Service, U.S. Department of the Interior Director's Orders

DO-2 *Park Planning*
DO-12 *Conservation Planning, Environmental Impact Analysis, and Decision Making*
DO-28 *Cultural Resource Management Guideline,* Release No. 5, 1997.
DO-47 *Sound Preservation and Noise Management*
DO-77 *Natural Resources Management*

U.S. Federal Government

1864 Act of Congress (13 Stat. 325)
1890 Act of Congress (26 Stat. 650)
1906 Joint Resolution of Congress (34 Stat. 831)
1955 Federal Air Quality Law
1963 Clean Air Act, as amended
1966 National Historic Preservation Act
1969 National Environmental Policy Act (NEPA)
1973 Endangered Species Act, as amended

1977 Clean Water Act
1990 Native American Graves Protection and Repatriation Act

36 CFR 800.11 40 CFR, Part 503

U.S. Department of the Interior, National Park Service

Conservation Planning, Environmental Impact Analysis, and Decision Making Director's Order #12, (2001).

Draft Environmental Assessment/ Cultural Center, Mesa Verde National Park, Colorado, March 2002.

Horton, (1994). *Historical American Engineering Record. Main Entrance Road* HAER No. CO. 79. *Mesa Verde National Park, Colorado.*

Preparers

National Park Service, Denver Service Center
Greg Jarvis, Natural Resource Specialist

National Park Service, Mesa Verde National Park
Erika Campos, Landscape Architect
George San Miguel, Natural Resource Specialist

Consultants

Mesa Verde National Park
Patty Trap, Park Planner
Noel Logan, 106 Compliance Officer
Frank Cope, Chief of Maintenance
Gary Gasaway, Roads and Trail Supervisor
Linda Towle, Chief of Research and Resource Management

Appendix A - US Fish and Wildlife Correspondence

JUN 05 2001

N1671 (DSC-PDS)
MEVE-278E
X Comp.
Memorandum

To: Field Supervisor, U.S. Fish and Wildlife Service, Ecological Services, 764 Horizon Dr., Bldg B, Grand Junction, CO., 81506

From: Natural Resource Specialist, Planning Group, Denver Service Center

Reference: Mesa Verde National Park, Pkg.278E, Main Park Road Improvements

Subject: List of Threatened or Endangered Species

The National Park Service (NPS) is initiating a planning project for improvements to the park entrance road for Mesa Verde National Park. The area of the proposed project includes the first 10 miles of park entrance road (maps attached). As the Natural Resource Specialist assigned to this project, I am requesting a current list of federally-listed or any other special status species that might occur in the locality mentioned above, and designated critical habitat, if any, for these species.

This letter will serve as a record that the NPS is initiating informal consultation with your agency pursuant to the requirements of the Endangered Species Act and National Park Service Management Policies.

We appreciate your response to this inquiry. Please send any responses to:

Greg Jarvis (DSC-PDS)
National Park Service
12795 W. Alameda Parkway
Denver, CO 80225
(303) 969-2263

Greg Jarvis

Attachment

cc:
MEVE-Superintendent
PM-Ron Shields

PDS:Gjarvis:aae:06/04/01:2263:MEVE278E

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
764 Horizon Drive, Building B
Grand Junction, Colorado 81506-3946

IN REPLY REFER TO:
ES/CO:NPS
MS 65412 GJ

June 22, 2001

Greg Jarvis (DSC-PDS)
National Park Service
12795 W. Alameda Parkway
Denver, Colorado 80225

Dear Mr. Jarvis:

This responds to your June 5, 2001, letters requesting a list of species that may be associated with NPS projects at Mesa Verde National Park. One project is described as upgrading the park entrance road and the other is for activities on Wetherill Mesa. We believe the following species should be considered during your project planning.

FEDERALLY LISTED SPECIES

Bald eagle	*Haliaeetus leucocephalus*
Mexican spotted owl	*Strix occidentalis lucida*
Southwestern willow flycatcher	*Empidonax traillii extimus*
Colorado pikeminnow[1]	Ptychocheilus lucius
Razorback sucker	*Xyrauchen texanus*
Sclerocactus mesae-verdae	Mesa Verde cactus

We have included the federally listed fish in the event either of the projects requires water from the San Juan River basin for project construction or operation. Any depletion of water from the basin would be considered a negative impact to these fish, and would require section 7 consultation with this office prior to authorization of the project.

There are no Federal candidate species within the project area.

Thank you for contacting us regarding these projects. Please contact Bob Leachman at the letterhead address or (970) 243-2778, if there are any questions.

Sincerely,

for Allan R. Pfister
Assistant Colorado Field Supervisor

cc: FWS/ES, Lakewood

BLeachman:MVNPSLtr.wpd:062201

[1]formerly squawfish

Appendix B - State Historic Preservation Officer Correspondence

United States Department of the Interior

NATIONAL PARK SERVICE
Mesa Verde National Park
Colorado 81330

IN REPLY REFER TO:

RECEIVED
SEP 23 2002
MESA VERDE NATIONAL PARK

H4217(MEVE)

August 29, 2002

RECEIVED
SEP 13 2002
CHS/OAHP

Ms. Georgiana Contiguglia
State Historic Preservation Officer
Colorado Historical Society
1300 Broadway
Denver, Colorado 80202

Dear Ms. Contiguglia:

Planned construction activities on the Mesa Verde National Park main entrance highway, in a location known as "B cut", will affect a previously recorded archeological site. This archeological site is located at the crest of a steep road cut on the south side of the main entrance highway. The construction of this new cut will require complete removal of the archeological site. The purpose of this proposed change is to eliminate rock-slides at this location that have been a major safety hazard and maintenance problem for years. This new cut will be constructed with a 1.5:1 slope with a rock fall ditch at the base. Construction is scheduled to begin in the fall of 2003.

The affected site (5MV3843) consists of the remains of a temporary work camp associated with the construction of the Mesa Verde NP entrance highway. When first recorded in 1977 the site consisted of two "forked-stick hogans" (essentially two brush shelters), with three, sparse density, trash concentrations in association, consisting of, primarily, rusted tin cans. Based on the presence of the two forked-stick brush shelters the site was assigned a Navajo cultural affiliation dating to the late 1920s or early 1930s. Mr. Larry Benally, a park employee and a member of the Navajo Tribe visited the location and concurred with our interpretation of the site as a Navajo, temporary campsite. The Bircher Fire in 2000 burned over the site and completely burned away all of the structural material on the forked-stick shelters (see enclosed photographs) so that, currently, the only physical remains still on the site are the three trash concentrations.

We are consulting with you regarding our determination of eligibility of this site. Based on the extreme fire damage to the site, it is our opinion that the site is no longer eligible for inclusion in the National Register. We believe the site has no integrity with no evidence of subsurface deposition. Based on this information, it is our opinion that a No Historic Properties Affected determination is warranted.

Enclosed are copies of the site forms, two site maps (1977 and 2002), a hand written list of artifacts and several site photographs including a photo from 1977.

If you agree with us regarding our determination please notify us in writing within 30 days. Please contact Noel Logan our Section 106 Compliance Archeologist, at (970) 529-5076 or (970) 564-1624 if you require further information.

Sincerely,

Larry T. Wiese
Superintendent

I concur Ann M. Collins, Deputy Date Sept. 17, 2002
State Historic Preservation Officer





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

Publication services were provided by Planning and Design Services, Denver Service Center. NPS D-232, June 2003

United States Department of the Interior / National Park Service