

Canyon de Chelly National Monument

National Park Service
U.S. Department of the Interior

Canyon de Chelly National
Monument, Arizona



Environmental Assessment / Assessment of Effect

South Rim Road Rehabilitation November 2006



ENVIRONMENTAL ASSESSMENT / ASSESSMENT OF EFFECT
South Rim Road Rehabilitation

Prepared For:
National Park Service



Canyon de Chelly National Monument
Arizona

U.S. Department of the Interior National Park Service

**Environmental Assessment / Assessment of Effect
South Rim Drive Rehabilitation**

**Canyon de Chelly National Monument
Apache County, Arizona**

Summary

The National Park Service, in cooperation with the Federal Highway Administration, Central Federal Lands Highway Division, is proposing to rehabilitate South Rim Drive in Canyon de Chelly National Monument, Arizona. South Rim Drive (also known as N7, Navajo Route 7) is an existing approximately 17.0- kilometer (10.6- mile) road that runs from the western Monument boundary at Highway 64(N7) east to the junction of Spider Rock Overlook Road. In addition to rehabilitating South Rim Drive, the proposed action also includes improvements to all South Rim Drive spur roads and overlooks, including Spider Rock Overlook Road. The proposed action also includes shoulder safety improvements at various locations along South Rim Drive where shoulders are currently very steep or nonexistent. In addition, the proposed action includes installing livestock fencing along the road corridor. The fencing may include 5 to 10 oversized culverts for moving livestock under the road to neighboring grazing areas. Improvements to the South Rim Drive intersections at the Visitor Center, at North Rim Drive, and at the road to the Thunderbird Lodge would also be implemented.

In addition to the roadway improvements, the proposed action includes parking area improvements that would be funded by the Federal Lands Highway Program: the parking area at the Visitor Center would be slightly expanded, reconfigured, and rehabilitated to accommodate oversized vehicles and the parking area at the White House Overlook would be expanded to increase the number of parking spaces.

The proposed action also includes a number of features and improvements that would be funded by sources other than the Federal Lands Highway Program as follows: the Cottonwood Campground parking/camping areas would be expanded and realigned to accommodate oversized vehicles; the Thunderbird Lodge parking area would be rehabilitated; access gates would be installed at overlook parking entrances and at the Visitor Center parking entrance that can be closed after hours to enhance management options for overnight use; an after- hours visitor information kiosk would be constructed to the west of the Visitor Center parking entrance near the proposed gate; and measures would be incorporated to facilitate management of unauthorized social roads and pullouts.

The action is needed because the existing road surfaces are aging and have begun to deteriorate; sections of South Rim Drive do not have shoulders or guardrails and have steep drop- offs adjacent to the roadway; there is insufficient capacity and constrained access for oversized vehicles at the Visitor Center and Cottonwood Campground; there is insufficient parking capacity at the White House Overlook and trail parking area; the current configuration and insufficient signage of the South Rim Drive intersections at the Visitor Center, North Rim Drive, and the road to the Thunderbird Lodge have led to unsafe conditions; to reduce vehicle/livestock accidents thus improving visitor and resident driving experience; insufficient management of unauthorized

SUMMARY

social roads, pullouts, and overlook areas has facilitated undesirable activities; and reapplication of roadway striping is necessary for the safety of vehicles traveling on the roadways and to provide effective use of parking areas.

This environmental assessment / assessment of effect examines in detail two alternatives: the No-action Alternative and the National Park Service Preferred Alternative. The Preferred Alternative includes all the project items indicated above. The Preferred Alternative would have no or negligible impacts to wildlife; threatened and endangered species / species of special concern; vegetation; geology and geologic hazards; air quality; water quality; museum collections; socioeconomics; environmental justice; community services; monument operations; transportation; safety; floodplains; wetlands/streamflow/hydrology; land use; unique ecosystems; unique or important wildlife or wildlife habitat; unique, essential, or important fish habitat; prime and unique farmlands; and energy resources.

The Preferred Alternative would contribute short- term minor localized adverse impacts to soundscapes and short- term minor to moderate adverse impacts to visitor use and experience, and the local community. There would be long- term negligible impacts to soundscapes and long- term beneficial impacts to visitor use and experience, and the local community. The Preferred Alternative is anticipated to result in negligible impacts to archeological resources, historic structures, and ethnographic resources.

With respect to threatened, endangered, or other special status species, both federally listed and state or other agency listed, a determination of *may affect, not likely to adversely affect* has been made for the Preferred Alternative.

Notes to Reviewers and Respondents

If you wish to comment on the environmental assessment / assessment of effect, you may mail comments to the name and address below or post comments to the website indicated below. It is the practice of the NPS to make all comments, including names and addresses of respondents who provide that information, available for public review following the conclusion of the National Environmental Policy Act process. Individuals may request that the NPS withhold their name and/or address from public disclosure. If you wish to do this, you must state this prominently at the beginning of your comment. Commentators using the website can make such a request by checking the box "keep my contact information private." NPS will honor such requests to the extent allowable by law, but you should be aware that NPS may still be required to disclose your name and address pursuant to the Freedom of Information Act. We will make all submissions from organizations and businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, available for public inspection in their entirety.

Please address comments to: Superintendent; Canyon de Chelly National Monument; Attn: South Rim Drive Rehabilitation, PO Box 588, Chinle, AZ 86503.

Comments may be submitted to the NPS Web site at:
<http://parkplanning.nps.gov/parkHome.cfm?parkId=35>

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FIGURE

- 1: Overview Map of Canyon de Chelly National Monument and Project Improvements 2

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ACRONYMS AND ABBREVIATIONS

APE	area of potential effect
CFR	<i>Code of Federal Regulations</i>
EA	environmental assessment
EIO	ethnographic isolated object
FHWA	Federal Highway Administration
N7	Navajo Route 7
MSO	Mexican spotted owl
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NPS	National Park Service
PAC	Protected Activity Center
USC	<i>United States Code</i>
USFWS	United States Fish and Wildlife Service

INTRODUCTION

PURPOSE AND NEED FOR ACTION

The National Park Service (NPS; Service), in cooperation with the Federal Highway Administration (FHWA), Central Federal Lands Highway Division, is proposing to rehabilitate South Rim Drive (also known as Navajo Route 7 [N7]) in Canyon de Chelly National Monument (Monument), Chinle, Arizona. South Rim Drive is an existing, approximately 17.0-kilometer (10.6-mile) road that runs from the western Monument boundary at Highway 64 (N7) east to the junction of Spider Rock Overlook Road. Figure 1 shows an overview map of the Monument, the extent of the road rehabilitation, and Monument improvements proposed under this action.

The proposed action would rehabilitate drainage and pavement conditions on South Rim Drive and the spur roads to and parking areas at White House, Sliding House, Tunnel, Tsegi, Spider Rock, and Junction overlooks. Curbing would be replaced or added as needed, and erosion problems at drainage ditches would be corrected. All routes would be maintained at their current width. Pavement conditions on South Rim Drive and the overlook roads for the most part are good (FHWA 2004). However, the pavement is older than 25 years and is subject to extensive cracking. Canyon de Chelly National Monument has an active road maintenance crew that keeps the cracks sealed (FHWA 2004).

The primary purpose of the proposed action is to improve visitor safety and experience, extend the life of roadways by rehabilitating road surfaces, and accommodate oversized vehicles. These improvements would result in better parking, circulation, and travel within the Monument. The action is needed because road surfaces within Canyon de Chelly National Monument are aging and deteriorating and currently there is insufficient capacity for visitor numbers and vehicle sizes.

In addition to the roadway rehabilitation work indicated above, guardrails would be added and shoulders improved as necessary along South Rim Drive to address safety concerns. The Navajo Department of Law Enforcement recorded 24 traffic accidents between 1997 and 2003 within the project area including four crashes involving animals, seven crashes involving other vehicles, and one crash with a fixed object. The majority of crashes occurred near the Visitor Center and Thunderbird Lodge (Tyler pers. comm. 2005). Improvements to the circulation patterns and pedestrian crossings would be made to the South Rim Drive / Visitor Center entrance, the South Rim Drive / North Rim Drive intersection, and the South Rim Drive / Thunderbird Lodge Road intersection. Livestock fencing will be installed along the road corridor. The fencing may include 5 to 10 oversized culverts for moving livestock under the road to neighboring grazing areas. This fencing will reduce vehicle/livestock accidents, thus improving visitor and resident driving experience as well as deter the use of social pullouts.

The increase in the size and number of oversized vehicles in the Monument has led to inadequate turning radii and parking stalls in numerous areas throughout the Monument. The proposed action would reconfigure and rehabilitate the parking area at the Visitor Center to accommodate oversized vehicles and improve circulation and pedestrian safety, and parking capacity at the White House Overlook would be expanded.

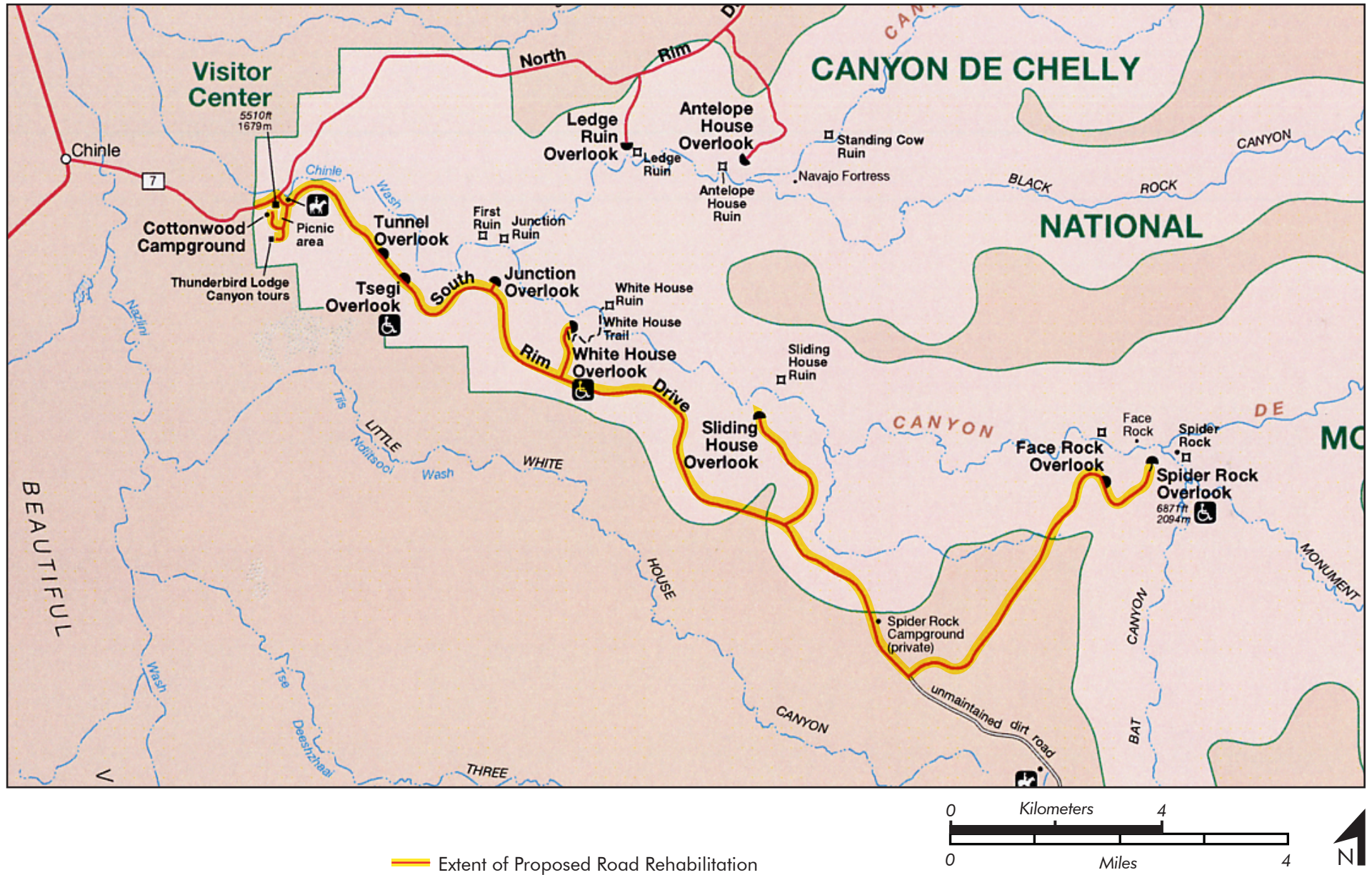


FIGURE 1
Overview Map of Canyon de Chelly National Monument
and Project Improvements

The proposed action also includes a number of features and improvements that would be funded by sources other than the Federal Lands Highway Program as follows: the Cottonwood Campground parking/camping areas would be expanded and/or realigned to accommodate oversized vehicles; the Thunderbird Lodge parking area would be rehabilitated; access gates would be installed at overlook parking entrances and at the Visitor Center parking entrance that can be closed after hours to enhance management options for overnight use; and an after-hours visitor information kiosk would be constructed to the west of the Visitor Center parking entrance near the proposed gate.

Along the length of South Rim Drive are roads (generally unpaved) that provide access to residential areas along with numerous unauthorized social roads. The unauthorized social roads have adversely impacted the natural and cultural resources of the Monument and in some instances enabled undesirable activities that impact both the community and visitors. Uncontrolled access to the various pullouts after normal visiting hours has also led to undesirable activities at the overlooks. To address these issues, the proposed action would implement measures to facilitate management and use of the unauthorized social roads and pullouts.

This environmental assessment (EA) / assessment of effect analyzes the Preferred Alternative and the No- action Alternative and their potential impacts on the environment. It has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA); NPS Director's Order 12: Conservation Planning, Environmental Impact Analysis and Decision Making, which outlines procedures for preparing NPS documents under NEPA; the regulations of the Council on Environmental Quality (40 *Code of Federal Regulations* [CFR] 1500- 1508); and the National Historic Preservation Act of 1966 (as amended) and revised regulations (36 CFR 800).

MONUMENT PURPOSE, SIGNIFICANCE, AND MISSION

In order to fully understand the effects of the proposed action, it is necessary to take into account the purpose, significance, and mission of the Monument. Unless otherwise stated, "Canyon de Chelly" refers to the Canyon de Chelly National Monument canyon system (e.g., Canyon de Chelly, Canyon del Muerto, Monument Canyon, etc.) and surrounding NPS managed areas.

Monument Purpose

The Monument purpose statements are based on national park legislation, enabling legislation for the Monument, legislative history, and NPS policies. The statements reaffirm the reasons for which the Monument was set aside as a unit of the national park system, and provide the foundation for national park management and use. Canyon de Chelly National Monument was established in 1931. It has an approximate area of 33,930 hectares (83,840 acres) and includes three major canyons: Canyon de Chelly, Canyon del Muerto, and Monument Canyon. Creation of the Monument established NPS's jurisdiction for administration of the cultural resources and other features of interest and gave NPS the right to construct roads, trails, and facilities for visitors. Canyon de Chelly National Monument is unique among national park system units in that the Navajo Nation retains actual ownership of the Monument lands as Navajo Tribal Trust Land. The Monument was established for the purposes of (NPS 2004):

preserving outstanding prehistoric Ancestral Puebloan archeological resources for their scientific, cultural, and scenic values

preserving and protecting features of archeological, historical, and sacred significance to the Navajo and other Native American peoples

providing for the protection and care of other scientific resources

providing for the education, care, and accommodation of visitors to the Monument

Monument Significance

Statements of monument significance capture the essence of the Monument's importance to the Navajo and Puebloan people and to our nation's natural and cultural heritage. The statements do not merely list the Monument's resources, but describe the Monument's distinctive properties within a regional, national, and international context. Defining monument significance in these terms helps decision makers preserve the resources and values integral to accomplishing the Monument's purpose. Canyon de Chelly National Monument is significant for the following reasons (NPS 2004):

Living community—Canyon de Chelly sustains a living community connected to a landscape of great historical and spiritual significance—a landscape composed of places infused with collective memory.

Partnership—Unique among units of the national park system, Canyon de Chelly is comprised entirely of Navajo Tribal Trust Land that remains home to a large canyon community. The National Park Service and Navajo Nation work in partnership to manage Monument resources and sustain the living community of Canyon de Chelly.

Connection to place—Many people embrace Canyon de Chelly as a place of profound power. It is essential to the spiritual, traditional, and cultural identity of American Indian communities throughout the American Southwest.

Integrity of cultural resources—Reflecting one of the longest continuously inhabited landscapes of North America, the cultural resources of Canyon de Chelly—including distinctive architecture, artifacts, and rock imagery—exhibit remarkable preservational integrity that provides outstanding opportunities for study and contemplation.

Prehistoric community and landscape—Canyon de Chelly preserves an archeological record that reveals the intimate connection between landscape and ancestral American Indian communities of the Colorado Plateau. This connection illustrates the possibilities and limits of the canyon environment, while at the same time expressing the creative ability of successive ancestral communities to mold and shape social space over thousands of years. Bound together by a common history and place, these early communities reflect an enduring heritage, a singularly important American historical landscape.

Historic community and landscape, the Diné (Navajo)—When first inhabited by the Diné in the early to mid 1700s, Canyon de Chelly emerged as a distinct community focused on

agriculture, peach orchards, cohesive settlements, and a close relationship with Hopi settlements both within the canyon and to the west. From these origins, the Diné of Canyon de Chelly have witnessed conflict and resistance, removal and renewal, the establishment of reservation life, and all of the uncertainties and promise of the modern era. While these events have challenged the canyon Diné, their ties to this living landscape and community continue to reflect the distinctive character and quality of previous centuries.

Traditional history of the Diné—Canyons embrace a sacred landscape embedded with traditional histories and origin accounts of extraordinary significance to the Navajo people. Establishing an inherently Navajo view of the past, these powerful accounts—many of which are depicted as “narrative pictorials” on canyon walls—provide a record of significant historical events, an understanding of the world’s origins and essential wisdom, and guidance on how to properly follow the Diné Way. Importantly, these accounts continue to be key “documents” for the Navajo people and community of Canyon de Chelly.

Water—The largest watershed on the Defiance Plateau, Canyon de Chelly provides a perpetual water source that has sustained diverse plant, animal, and human life throughout time.

Intimate landscape—The vibrant yet serene beauty of Canyon de Chelly is found in the shapes, colors, contrasts, and interplay of light and shadows across natural and cultural features. These qualities create intimate, inspirational, and memorable experiences for residents and visitors from around the world.

Biodiversity—As a reflection of geographical location and physiographic complexity, Canyon de Chelly contains a remarkable range of habitats that encourage biodiversity.

Environmental change—Canyon de Chelly provides outstanding opportunities to observe the process and outcomes of environmental change brought about by natural and human forces.

Monument Mission

Monument purpose describes the specific reason the Monument was established. Monument significance is the distinctive features that make the Monument unique. Together, purpose and significance lead to a concise statement—the mission of the Monument. NPS mission statements describe conditions that exist when the legislative intent for the park or Monument is being met.

The mission of Canyon de Chelly National Monument is as follows (NPS 2004):

The National Park Service and Canyon de Chelly National Monument work in partnership with the Navajo people and other Indian tribes to protect and interpret Canyon de Chelly as a landscape of historical, sacred, and national significance as well as enhancing the cultural and social aspirations of the Navajo people.

Mission goals describe the desired future conditions achieved as a result of the proper management of the Monument. The mission goals for Canyon de Chelly National Monument are (NPS 2004):

Canyon de Chelly serves as a source of inspiration, pride, and cultural understanding for the Navajo people and visitors alike.

Canyon de Chelly protects the landscape, structures, archeological and ethnographic resources, and artifacts that reflect and document the history of the canyon system and area.

Canyon de Chelly serves as a management model in partnerships between the National Park Service, Navajo Nation, canyon communities, and other entities.

Canyon de Chelly provides outstanding opportunities to study and contemplate the intimate relationships between land and people.

Canyon de Chelly and its residents resolve common concerns and share responsibilities regarding resource protection, community privacy, and impacts to the canyon system.

The National Park Service and Navajo Nation provide a diverse range of visitor experiences and access to the canyon system while protecting canyon resources.

Canyon de Chelly achieves a sustainable watershed that preserves Monument resources, the living community landscape, and the canyon residents' connection to place.

The Navajo Nation and local Navajo residents agree with and support the mission of the National Park Service for Canyon de Chelly.

Canyon de Chelly's regular interpretive programs are supported by a variety of other exceptional educational opportunities to enhance knowledge and understanding among visitors, families, and individuals of all age groups.

Purpose of Park Roads

An objective of the proposed action is to maintain and improve the Monument road system consistent with the purpose of a national park road as summarized in the "Park Road Design" memorandum dated February 20, 1986, from William Mott, then Director of the National Park Service:

The purpose of park roads remains in sharp contrast to that of the federal and state highway systems. Park roads are not intended to provide fast and convenient transportation; they are intended to enhance visitor experience while providing safe and efficient accommodation of park visitors and to serve essential management access needs.

As stated in the 1984 NPS *Park Roads Standards*, the fundamental purpose of national parks—bringing humankind and the environment into closer harmony—dictates that the quality of the park experience must be the primary concern. Full enjoyment of a national park visit depends on its being a safe and leisurely experience.

Park roads provide the basic means of visitor access to the parks. Park roads can be both a means to a destination as well as the destination itself. For this purpose, park roads are designed with care to respect the terrain and blend into the environment through which they pass. They should be designed to provide the visitor scenic views while avoiding long segments which encourage high speeds so that the terrain through which they traverse may be enjoyed. Where terrain and safety permit, and where consistent with park management, stopping points should be provided for park visitors to more completely view and experience the park and its resources.

When existing park roads are examined, decisions can be made as to the types and sizes of vehicles that can be accommodated. A decision may be made to limit the size of vehicles traveling on the roadway rather than reconstructing the road to accommodate them. Other means of handling oversized visitor vehicles may include: providing parking areas for oversized vehicles at park entrances, restricting oversized traffic in certain areas, converting two-way roads into one-way systems, reducing speed limits, or providing alternate means of transportation.

PROJECT BACKGROUND, PREVIOUS PLANNING, AND SCOPING

Project Background

This project is a continuation of a previous pavement improvement project implemented in 2002. That project initially intended to rehabilitate the roads on the South Rim, but was shifted to the North Rim and South Rim spur roads to accommodate construction of a new waterline that could damage a newly rehabilitated South Rim Drive.

Previous Planning

As early as 1996 specific discussions between Monument and Navajo Nation Historic Preservation Office staff (Peter Noyes, Ron Maldonado, and Rolph Nabahan) addressed the need to rehabilitate various road corridors. During a meeting held on May 24, 2002, Monument staff continued project planning with the Navajo Nation Division of Fish and Wildlife, Navajo Nation Water Resources, the Natural Resources Conservation Service, and the United States Geological Survey.

The Monument is involved in ongoing development of park procedures that will create a vision and clear direction for the Monument's future. Park procedures are used to establish priorities for allocating resources, achieving Monument goals, and guiding development and use of the Monument's resources. The road rehabilitation proposed under this action would improve visitor safety and experience and extend the life of the roadways in accordance with the Monument's mission and goals and consistent with the guidance being developed in these park procedures.

Scoping

Scoping is an effort to involve agencies and the general public in determining issues to be addressed in this environmental assessment / assessment of effect. Scoping is used to

determine important issues to be given detailed analysis in the environmental assessment and eliminate issues not requiring detailed analysis; allocate assignments among the interdisciplinary team members and/or other participating agencies; identify related projects and associated documents; identify permits, surveys, consultations, etc. required by other agencies; and create a schedule that allows adequate time to prepare and distribute the environmental assessment 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 Tribal Historic Preservation Officer and American Indian tribes) to obtain early input.

To begin the planning process, staff of Canyon de Chelly National Monument and resource professionals of the National Park Service, Denver Service Center, and Federal Highway Administration conducted internal scoping. This interdisciplinary process defined the purpose and need, identified potential actions to address the need, determined the likely issues and impact topics, and identified the relationship of the proposed action to other planning efforts at Canyon de Chelly National Monument.

Letters soliciting comments regarding preparation of the environmental assessment were sent to interested parties and potentially affected agencies on July 1, 2005 (included in Appendix A). Responses that were received pertaining to these letters are contained in Appendix B. Consultation is ongoing with the U.S. Fish and Wildlife Service (USFWS) and the Navajo Tribal Historic Preservation Officer.

Through ongoing consultations, local residents have expressed a desire to protect livestock, residents, and visitors by installing fencing along the affected roadways. Such fencing would reduce vehicle/livestock accidents, thus improving visitor and resident driving experience as well as deter the use of social pullouts.

The community of Chinle, residents of Canyon de Chelly, local Chapter Houses, Navajo Nation Fish and Wildlife, Navajo Nation, USFWS, the public, American Indian groups traditionally associated with the lands of Canyon de Chelly National Monument, and other federal and state agencies will have an opportunity to review and comment on this environmental assessment / assessment of effect.

ISSUES AND IMPACT TOPICS

Issues and concerns affecting this environmental assessment / assessment of effect were identified from past NPS planning efforts and internal and external scoping.

The issues and concerns identified in the planning stage identified the impact topics to be addressed in the environmental assessment / assessment of effect. Issues identified include conformance of the project activities with the Monument mission and goals outlined above and the potential impacts to soundscapes, visitor use and experience, and cultural resources. Additionally, given the unique relationship between the NPS and the Navajo community at Canyon de Chelly National Monument, special consideration is given to the proposed action's effects on the local Navajo community.

NEPA requires federal agencies to use all practicable means to restore and enhance the quality of the human environment and to minimize or avoid adverse effects to the environment resulting from their actions. The proposed action was developed to improve or minimize the impact to natural and cultural resources and to the visitor experience, while protecting the health and safety of visitors and the Navajo community. Measures would be implemented to avoid the introduction of invasive species and to reclaim previously disturbed areas.

Impact topics are the resources that could be affected by the issues and concerns associated with the proposed action. Specific impact topics were developed for analysis and to allow comparison of the environmental consequences of each alternative. These impact topics were identified based on federal laws, regulations, and executive orders; *NPS Management Policies 2001*; project issues; and NPS knowledge of unique or easily impacted resources. A brief rationale for the selection of each impact topic is given below, as well as the rationale for dismissing specific topics from further consideration. Resource topics that have no or negligible impact are dismissed from further analysis.

IMPACT TOPICS SELECTED FOR DETAILED ANALYSIS

Soundscapes

Section 4.9 of the *NPS Management Policies 2001* (2000) states that the NPS “will preserve, to the greatest extent possible, the natural soundscape ... [which] is the aggregate of all the natural sounds that occur in parks, together with the physical capacity for transmitting natural sounds.” Currently there are existing impacts to natural sound as a result of vehicle and visitor use of the roadways and overlooks, activities by concessionaires, park personnel, canyon residents, and activities in the campground. The proposed action would introduce heavy equipment and other mechanical tools in association with the rehabilitation of the roadways and other improvements that would create additional short-term increases in noise impacts to natural sound. In addition, the proposed action would place a “rumble strip” along the centerline of South Rim Drive in the vicinity of the Visitor Center entrance that could result in long-term noise impacts, if vehicles were to regularly cross the centerline at that location. As a result, soundscapes are addressed in detail in the environmental assessment / assessment of effect.

Visitor Use and Experience

NPS Management Policies 2001 (2000), sections 7.1 and 8.2, define the Service’s direction for and commitment to providing enjoyment of Monument resources for all visitors, and to provide education and interpretation of Monument resources and the values they represent. In the long term, implementation of the proposed action would enhance visitor experience as a result of the positive impacts of creating safer roads and improved access. Local residents frequently move their livestock from grazing area to grazing area crossing the road as well as allowing for open grazing. Under the open grazing policy there are livestock fatalities and vehicle damage to residents and visitors. The proposed action includes measures to reduce vehicle/livestock accidents thus improving visitor and resident driving experience. Although all attempts would be made to avoid closing sections of the Monument during construction, there is some potential that Monument concessionaires and/or visitors may be temporarily excluded from an area for safety reasons, or that portions of the Cottonwood Campground could be

temporarily closed, while project construction and improvements are implemented. In addition, the proposed action includes measures to curb undesirable activities associated with the overlooks and unauthorized social roads that otherwise could contribute to a poor visitor experience. Therefore, visitor use and experience is addressed in detail in the environmental assessment / assessment of effect.

Archeology

Cultural resource surveys have been completed for some sections of the Monument. However, this work remains incomplete for most of Canyon de Chelly National Monument.

Comprehensive cultural resources surveys for the Monument will be part of an ongoing, systematic, parkwide survey effort. Previously unsurveyed portions of South Rim Drive were designated for survey by NPS staff in support of the proposed action. A heritage resources survey of these portions of South Rim Drive was completed in June 2006. The survey resulted in the documentation of 18 heritage resources. Seven of the sites were provisionally recommended as eligible to the National Register of Historic Places (National Register), all under Criterion D (has yielded, or may be likely to yield, information important to prehistory or history).

Implementation of the proposed action includes the use of heavy equipment and the installation of fencing that could result in direct impacts to surface and/or to subsurface resources thus representing potential impacts to the above archeological resources. Because of the potential for impacts as a result of the proposed action, archeological resources are addressed in detail in the environmental assessment / assessment of effect.

Historic Structures

The term “historic structures” refers to both historic and prehistoric structures, which are defined as constructions that shelter any form of human habitation or activity. Canyon de Chelly National Monument contains numerous historic Navajo and prehistoric Puebloan structures. The locations of most major historic and prehistoric structures in Canyon de Chelly National Monument are known; however, detailed documentation has only been completed for a handful of these structures. Unserved portions of South Rim Drive designated by NPS staff were surveyed for heritage resources in June of 2006, as previously mentioned. The survey documented three standing Navajo hogans. All were provisionally recommended as eligible to the National Register.

Implementation of the proposed action includes construction activities and the installation of fencing that could have the potential to impact historic structures. Because of the potential for impacts as a result of the proposed action, historic structures are addressed in detail in the environmental assessment / assessment of effect.

Ethnographic Resources

Per NPS Director’s Order 28 (DO- 28) Cultural Resource Management, ethnographic resources are defined as any site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it. According to DO- 28 and Executive Order

13007 on sacred sites, the NPS should try to preserve and protect ethnographic resources. Canyon de Chelly National Monument contains numerous individual ethnographic resources that are all interrelated and tied closely to the landscape and resources of the canyon. The above-mentioned recent heritage resources survey documented three ethnographic isolated objects along South Rim Drive. None of these were found to meet criteria for National Register eligibility. Other ethnographic resources, such as plants used for traditional purposes, may be reached by using unauthorized social roads.

Implementation of the proposed action includes the use of heavy equipment and the installation of fencing that could result in impacts to surface and/or to subsurface resources thus potentially impacting ethnographic resources. Additionally, closure of certain unauthorized social roads could impact access to ethnographic resources. Because of the potential for impacts as a result of the proposed action, ethnographic resources are addressed in detail in the environmental assessment / assessment of effect.

Local Community

Although all attempts would be made to avoid closing sections of the Monument during implementation of the proposed action, there is some potential that Monument concessionaires and/or residents may be temporarily excluded from an area for safety reasons, or that portions of the Cottonwood Campground could be temporarily closed, while project construction and improvements are implemented. Temporary road closures and/or restrictions during construction could result in commuter and school traffic delays thus impacting access to and from Chinle. Local residents frequently move their livestock from grazing area to grazing area crossing the road as well as allowing for open grazing. Under the open grazing policy there are livestock fatalities and vehicle damage to residents. The proposed action includes measures to reduce these vehicle/livestock encounters.

In the long term, implementation of the proposed action would provide a positive experience for the community as a result of creating safer roads and improved access. However, the proposed action includes measures to curb undesirable activities associated with unauthorized social roads within the Monument. Although this could provide a positive impact for the community as a whole, it also could result in the obliteration of certain unauthorized social roads that are currently utilized by members of the local community. For these reasons, local community is addressed in detail in the environmental assessment / assessment of effect.

IMPACT TOPICS DISMISSED FROM DETAILED ANALYSIS

Wildlife

Canyon de Chelly National Monument supports a diverse assemblage of resident and migrant wildlife. The canyon riparian habitats, particularly in the upper canyons, contain some of the most important wildlife habitat in the Monument.

NPS policy is to protect the components and processes of naturally occurring wildlife communities, including the natural abundance, diversity, and ecological integrity of animals (NPS *Management Policies* 2001, Section 4.4). The majority of the activities associated with the proposed action would occur on currently paved or otherwise unvegetated surfaces, within or

near the existing road corridor and in current areas of high visitor activity. The road rehabilitation, campground, parking and intersection improvements, and other activities associated with the proposed action would involve activities with the potential to affect wildlife or their habitat through noise, habitat disturbing activities, and incidental death or injury. The proposed action would include ground disturbance and permanent removal of some areas of vegetation. The minimal and linear nature of vegetation removal for the South Rim Drive, spur road improvements, and the limited scope of mature tree removal from Cottonwood Campground would result in negligible impacts on habitat for wildlife species at a landscape level. The proposed action includes wire fencing along both sides of the project roadways to protect livestock, residents, and visitors, as well as to deter the use of social pullouts. This fencing has the potential to restrict wildlife movement.

The proposed action includes the measures described below that would reduce potential adverse impacts to wildlife to negligible levels.

- All wire livestock fencing proposed along the project roadways shall be wildlife friendly, meaning that the bottom wires will be barbless. The proposed livestock fencing along the road corridor may include 5 to 10 oversized culverts intended for moving livestock under the road to neighboring grazing areas. These culverts would also facilitate the movement of wildlife that would be impeded by the fencing.
- The contractor would be required to maintain strict garbage control so that scavengers (e.g., corvids) are not attracted to the project area. No food scraps would be discarded or fed to wildlife.
- Potential roadside habitat for small wildlife species consisting of downed trees and rock piles would be replaced upon completion of project construction activities.
- Any project- related vehicle or equipment operating on unpaved roads would not exceed a speed limit of 40 kilometers per hour (25 miles per hour).
- Cross- country (off- road) travel would not be authorized, except under life-threatening/emergency situations.
- The field contact representative would conspicuously stake, flag, or mark work area boundaries to minimize surface disturbance to the surrounding habitat. Material stockpiling, machinery storage, and vehicle parking would only be permitted in designated areas.
- No feeding of feral dogs or cats or other domestic animals would be allowed.
- Contractors working in the Monument would be given orientation concerning proper conduct of operations. This orientation would be provided in both written form and verbally (at a preconstruction meeting). Orientation topics include:
 - Wildlife should not be approached or fed.
 - Collection or damage of any park resources, including wood, rocks, artifacts, plants and animals, is strictly prohibited.
 - Contractor must have a safety policy and hazardous waste and spills policy in place and follow it.

Impacts to wildlife due to construction, noise disturbance, increased human and mechanical activity, and vegetation removal would be minimal and temporary. Potential impacts to wildlife would last only as long as construction occurred and would be reduced by the

measures identified above. Impacts to wildlife would be negligible and short term. No long-term impacts to wildlife are anticipated. Therefore, wildlife is dismissed as an impact topic in this document.

Threatened and Endangered Species / Species of Special Concern

The Endangered Species Act of 1973, as amended, requires an examination of impacts on all federally listed threatened or endangered species and the habitat on which they depend. NPS policy (NPS *Management Policies* 2001, Section 4.4.2.3) also requires examination of the impacts on federal candidate species as well as state- listed threatened, endangered, and candidate species and those unique to the Monument. In addition, consultation with Navajo Nation Fish and Wildlife is required and this environmental assessment / assessment of effect considers potential impacts to species listed on the Navajo Nation endangered species list (see Appendix C for the Navajo Nation endangered species list).

The USFWS and the Navajo Nation Natural Heritage Program have identified three species of concern that could be impacted as a result of vegetation removal or disturbance during construction activities associated with the proposed action. These species include the southwestern willow flycatcher (*Empidonax traillii extimus*), listed as endangered by the USFWS and the Navajo Nation; the Mexican spotted owl (*Strix occidentalis lucida*), listed as federally threatened by the USFWS and as endangered by the Navajo Nation; and the golden eagle (*Aquila chrysaetos*), listed as endangered by the Navajo Nation only. Additionally, potential exists for residential or transitory use of riparian/wooded habitats by the yellow-billed cuckoo (*Coccyzus americanus*), listed as a candidate species by the USFWS, as an endangered species by the Navajo Nation, and as a State of Arizona species of concern. Peregrine falcons, although federally delisted, have been identified as a Species of Management Concern by the Monument. Bald eagles (*Haliaeetus leucocephalus*), listed as federally threatened by the USFWS and as a State of Arizona species of concern, and ferruginous hawks (*Buteo regalis*), listed as a State of Arizona species of concern, may potentially occur in the Monument. California condors (*Gymnogyps californianus*), federally listed as a 10(j) nonessential, experimental population in the state of Arizona and listed as endangered (Group 4) by the Navajo Nation, may also potentially occur in the Monument.

No threatened or endangered plants are known to occur in the project area (NPS Vegetation Mapping Project, in preparation, per Leslie, pers. comm. 2006). Navajo sedge (*Carex specuicola*), listed federally and by the state of Arizona as threatened and listed as endangered (G3) by the Navajo Nation, is typically found in hanging gardens on sandstone cliffs or at the base of cliffs. The action will take place a significant distance from any cliffs where Navajo sedge could be impacted. Inventories for Zuni fleabane (*Erigeron rhizomatus*), federally listed as threatened and listed as endangered (G4) by the Navajo Nation, will be initiated in 2007. At this time, Zuni fleabane is not known to occur in the project area (Leslie, pers. comm. 2006).

Informal consultations are ongoing with both the USFWS and the Navajo Nation. The road rehabilitation, campground, parking and intersection improvements, and other activities associated with the proposed action would involve activities with the potential to affect threatened and endangered species / species of special concern or their habitat through noise, habitat disturbing activities, and incidental death or injury. The proposed action would include ground disturbance and permanent removal of some areas of vegetation. The minimal

and linear nature of vegetation removal for the South Rim Drive improvements and associated project conservation measures would result in negligible effects on habitat for special status species at a landscape level. The majority of the activities associated with the proposed action would occur on currently paved or otherwise unvegetated surfaces, within or near the existing road corridor and in current areas of high visitor activity. The areas proposed for the Visitor Center and White House Overlook parking expansions/reconfigurations are generally unvegetated and disturbed.

The proposed action includes the conservation measures described below that would reduce potential adverse impacts to threatened and endangered species / species of special concern that may be impacted to negligible levels.

- Prior to the initiation of construction activities, a qualified biologist or appropriate Monument staff shall survey the project area to determine the presence or absence of Mexican spotted owl, golden eagle, peregrine falcon, ferruginous hawk, bald eagle, southwestern willow flycatcher, and California condor per the guidelines outlined in the following paragraphs. Surveys of species habitat would follow all aspects of standard protocols. Based on the results of these surveys, the following conservation measures would be implemented as appropriate. If species are not present, then construction activities may continue subject to the conditions outlined below.
- Mexican Spotted Owl (MSO), Golden Eagle, Peregrine Falcon, Ferruginous Hawk, Bald Eagle
 - If the project occurs within a Protected Activity Center (PAC) with no known nest site, all construction activity would be restricted to the non- breeding season. However, if the project in a PAC is at least the distance specified below from known nest sites and the project does not include blasting, the project can be implemented during the breeding seasons.

Species	Minimum Distance (kilometer [mile])	Breeding Season	Non-Breeding Season
MSO	0.8 (0.5)	March 1 to August 31	September 1 to February 28
Golden eagle, peregrine falcon, ferruginous hawk	1.2 (0.75)	February 1 to August 31	September 1 to January 31
Bald eagle	1.2 (0.75)	December 1 to June 30	July 1 to November 30

- If the project occurs outside of a PAC, but within 1 mile of a known PAC nest or roost site, or the boundary of a PAC where the nest or roost site is not known, or unsurveyed restricted, protected, or predicted habitat, all blasting in that project area would be restricted to the non- breeding season:
 - MSO: September 1–February 28
 - Golden eagle, peregrine falcon, ferruginous hawk: September 1–January 31
 - Bald eagle: July 1–November 30
- If the project occurs outside of a PAC, but within 0.8 kilometer (0.5 mile) of a known PAC nest or roost site, or the boundary of a PAC where the nest or roost

site is not known, or unsurveyed restricted, protected, or predicted habitat, light and heavy construction activity (as defined below) in that project area would be restricted to the non-breeding season:

- MSO: September 1–February 28
 - Golden eagle, peregrine falcon, ferruginous hawk: September 1–January 31
 - Bald eagle: July 1–November 30
- If the project is more than 0.4 kilometer (0.25 mile) from the situations outlined above, light construction activity (as defined below) can occur at any time.
- Nesting Bald Eagles (in addition to above measures)
 - No adverse changes to the landscape or increased access will occur within the boundaries of any existing or planned Nesting Bald Eagle Area. Closures will be placed around any bald eagle nests discovered in the project area.
 - If by March 31, the breeding pair is not occupying the breeding area or the specific nest a closure protects, or the pair in an occupied breeding area does not lay eggs in a nest within the closure, then the closure can be lifted and the area opened to activity.
 - If the pair lays eggs but the breeding attempt fails, the closure can be opened if the pair does not double clutch within 45 days after the failure.
 - If a new breeding area or new nest in a known breeding area is discovered (not within the current closure), the land manager will discuss the need to develop a new closure or adjust the boundaries of the current closure.
 - Annual winter surveys of bald eagles within the project area and the park would continue according to established protocol.
- Southwestern Willow Flycatcher
 - Emergency closures would be placed at all known or suspected southwestern willow flycatcher nest sites (with a 0.8-kilometer [0.5-mile] buffer). These closures would be in place from May 1 to July 15 and include closure of visitor use, including hiking, camping, construction, and exotic plant removal activity.
 - Annual surveys of suitable southwestern willow flycatcher habitat within the project area and the park would continue.
- California Condors
 - If condor nesting activity is discovered within 1.6 kilometers (1 mile) of the project area, project activity will be restricted during the active nesting season (February 1 to November 30).
 - If condor nesting activity is known within 0.8 kilometer (0.5 mile) of the project area, light and heavy construction (as defined below) in the project area will be restricted during the active nesting season (February 1 to November 30).
 - If a condor occurs at the project site, project activity will cease until the condor leaves on its own or until techniques resulting in the condor leaving the area are employed by permitted personnel.
 - The site will be cleaned up at the end of each working day in order to minimize the likelihood of condors visiting the site.

- **Definitions of Construction Activities**

- **Heavy Construction**

Heavy construction would require the use of large equipment for actions such as earthmoving, rock excavating, and building construction.

1. **Earthmoving:** Earthmoving activities would require the use of heavy equipment such as large bulldozers, scrapers, and excavators for moving large areas of soil and rocks. This activity would be typical of construction of large facilities or roads where large areas of cut and fill would be manipulated (these are rare situations).
2. **Rock excavation, including trenching (does not include blasting):** Work involving rock excavating and trenching would typically require the use of heavy equipment such as hoe-rams, rock saws, hammer hoes, rippers on bulldozers, and large trackhoes with hydraulic hammers. This type of activity would be used for utility lines and foundations where rock is present. The operation of the equipment necessary to excavate rock can be very loud and can also result in vibration. The sound generated from the rock excavation itself can also be very loud.

- **Light Construction**

Light construction is defined as those construction activities that are not described above for heavy construction. Typically light construction activities would require smaller pieces of equipment that do not typically generate as much noise as those activities listed for heavy construction. Light construction would include such activities as road rehabilitation and maintenance that does not require the use of heavy earthmoving equipment, trenching in dirt (not rock), concrete work, earthwork that does not involve heavy earthmoving equipment, trail construction (if it does not require the use of heavy earthmoving equipment or rock excavation), and building construction of two stories or less (that would not require a crane). Typical equipment that would be used for these types of activities include backhoes, small dump trucks, chainsaws, jackhammers, small bulldozers, bobcats, pavers, small base/soil compactors, punjars, and graders. Blasting, the use of large earthmoving equipment, and the use of very loud equipment (like rocksaws and hoe-rams) would not be used during light construction activities.

- **Blasting**

In general the purpose of blasting is to fracture materials so that they can be more easily excavated or removed. Blasting is done in two primary ways: (1) uncontained blasting, where materials may be ejected from the immediate area, such as is often done for mining purposes and (2) contained blasting, which occurs underground and where material is not ejected from the blast site. This second type of blasting is the most common type used in national parks. This type of blasting is considered an option for projects where deemed necessary and appropriate. This type of blasting would typically result in a muffled roar and ground vibration. Typically, the contractor would drill to the depth of the excavation in a grid pattern, insert the proper amount of explosive for the depth desired, and then provide a protective cover (blasting mat or earth fill) over the area of the blast. When the blast occurs, the ground would rise slightly in the area, then return to about ground level. The desired excavation limits would be developed by the blast and a backhoe or shovel would be used

to remove the material. The result is typically a neat, clean excavation in the rock.

Blasting is usually only permitted by NPS if other tools are impractical or as a last resort. NPS will restrict blasting for a variety of reasons such as proximity to visitor/employee areas, proximity to resident's homes or other structures, and proximity to sensitive resources. Blasting would only be used for a project when it is considered the best tool for the job by the contractor and is permitted by the NPS. A blast could be loud but would last only milliseconds. All blasting would be conducted in accordance with Director's Order 65 (Explosives Use and Blasting Safety) and a blasting safety plan would be developed prior to implementation.

Potential impacts to threatened and endangered species / species of special concern would last only as long as construction occurred and would be reduced by the measures identified above. Construction activities would not occur during breeding or dispersal seasons. Impacts to threatened and endangered species / species of special concern would be negligible and short term. Therefore, threatened and endangered species / species of special concern are dismissed as an impact topic in this document.

Vegetation

It is the policy of the NPS to protect the components and processes of naturally occurring biotic communities, including the natural abundance, diversity, and ecological integrity of plants and animals (NPS *Management Policies* 2001, section 4.4). Canyon de Chelly National Monument contains numerous individual ethnographic resources that are all interrelated and tied closely to the landscape and resources of the canyon. These resources include areas where traditional ceremonies take place, traditional agricultural areas, locations where natural herbs or other medicinal materials and basket making materials are collected, and domestic areas that have been continually inhabited for several generations. Unmanaged access to these areas has resulted in the degradation of vegetation due to the creation of use trails and unauthorized social roads.

The vegetation of Canyon de Chelly National Monument is variously classified by different authors as part of the southern Great Basin Desert (Brown 1994) and part of the Upper Sonoran life zone (Cook 1994). Seven major vegetation communities have been identified in the Monument: canyon- bottom; talus; springs, seeps, and other wet places; piñon- juniper continuum; lower shrub grassland; sagebrushland; and canyon rim, cliffs, and ledges (Dennis 1975; Harlan and Dennis 1976). The communities found primarily in the canyons (canyon- bottom, talus slope, springs, seeps and other wet places, and canyon rims cliffs and ledges) tend to be more diverse in composition than the communities found primarily on the plateau (piñon- juniper continuum, sagebrushland, and low shrub- grassland).

Nonnative trees, shrubs, and grasses occur throughout much of the Monument. The following nonnative species of particular concern are known to occur in the project area: cheatgrass (*Bromus tectorum*), yellow sweetclover (*Melilotus officinalis*), Russian thistle (*Salsola* spp.), Kentucky bluegrass (*Poa pratensis*), kochia (*Kochia scoparia*), and Russian knapweed (*Acroptilon repens*). Russian knapweed is listed as a "prohibited and restricted noxious weed" by the state of Arizona (Leslie, pers. comm. 2006).

The proposed action would result in the permanent removal of minimal amounts of vegetation in areas of clear zone improvements along South Rim Drive, the Visitor Center, the White House Ruin parking area, and the Cottonwood Campground. Approximately eight non- native or damaged trees would be impacted in the Cottonwood Campground. No rare, sensitive, or unique vegetation has been identified within the proposed project impact areas (Leslie, pers. comm. 2006).

Vegetation may be impacted by construction activities and increased human and mechanical activities. Temporary clearing of vegetation would be associated with minimal areas of slope stabilization; these areas would be revegetated with native species. The amount of vegetation impacted would be negligible on a landscape level and would occur in areas within or near the existing road corridor and in current areas of high visitor activity. The areas proposed for the Visitor Center and White House Overlook parking expansions/reconfigurations are generally unvegetated and disturbed. The proposed action includes the measures described below that would reduce potential adverse impacts to vegetation to negligible levels.

- For much of the corridor, revegetation work would be minimized because construction would be completed in previously disturbed areas of the roadway template. Staging areas would utilize previously disturbed sites such as parking lots.
- Revegetation work would use soil conserved along the corridor and native species from genetic stocks originating in Canyon de Chelly National Monument. Revegetation efforts would also attempt reconstruction of the natural spacing, abundance, and diversity of native plant species.
- Vegetation impacts and potential compaction and erosion of bare soils would be minimized by replacement of topsoil in as near the original location as possible, scarification, mulching, and seeding/planting with species native to the immediate area.
- Reclaimed areas would be monitored after construction to determine if reclamation efforts are successful or if additional remedial actions are necessary.
- Remedial actions could include installation of erosion- control structures, reseeding and/or replanting the area, and controlling non- native plant species.
- In an effort to avoid introduction of non- native/noxious plant species, no hay bales would be used during revegetation. On a case- by- case basis the following materials may be used for any erosion- control dams that may be necessary: certified weed- free rice straw, cereal grain straw that has been fumigated to kill weed seed, and wood excelsior bales.
- Undesirable plant species would be monitored and controlled as necessary. To prevent the introduction and minimize the spread of non- native vegetation and noxious weeds, the following measures would be implemented during construction:
 - Treat existing populations of exotic vegetation at the construction site prior to construction activities.
 - Minimize soil disturbance.
 - Pressure wash and/or steam clean all construction equipment to ensure that all equipment, machinery, rocks, gravel, or other materials are cleaned and weed free before entering Canyon de Chelly National Monument.
 - Cover all trucks hauling asphalt or other fill materials from outside the monument to prevent seed transport.

- Have the location of the staging area for construction equipment park-approved and treated for exotic vegetation.
- Limit vehicle parking to existing roadways, parking lots, access routes, or the staging area.
- Limit disturbance to roadsides and culvert areas, including limiting equipment to the roadbed area; no machinery or equipment should access areas outside the construction zone.
- Obtain all fill, rock, or additional topsoil from the project area, if possible. If not possible, obtaining weed-free sources from NPS approved sources outside the Monument would be required.
- Initiate revegetation of disturbed sites immediately following construction activities using site adapted native seed and/or plants.
- Monitor disturbed areas following construction to identify growth of noxious weeds or non-native vegetation. Treatment of non-native vegetation would be completed in accordance with NPS- 13, *Integrated Pest Management Guidelines*. Monitoring and follow-up treatment would occur for two to three years after construction is completed.

Potential impacts to vegetation would last only as long as construction occurred and would be reduced by the measures identified above. Impacts to vegetation would be negligible and short term. No long-term impacts to vegetation are anticipated. Therefore, vegetation is dismissed as an impact topic in this document.

Geology, Soils, and Geologic Hazards

Canyon de Chelly National Monument lies within the geologic province known as Colorado Plateau. The geology at Canyon de Chelly consists of the Chinle Formation and the De Chelly Sandstone. The lowest member of the Chinle Formation, the Shinarump Conglomerate, forms the highly resistant caprock. The upper Chinle Formation that consists of variegated shale derived from volcanic ash is present in only a couple of isolated places along South Rim Drive. The De Chelly Sandstone consists of pale, peach colored, fine-grained sandstone that was deposited in a vast desert during Permian time. This massive cross-bedded sandstone forms steep cliffs along the rim, tall spires such as Spider Rock, and cave-like alcoves. The subgrade soils encountered along South Rim Drive consist mainly of silty sand and clayey sand with varying amounts of gravel. The subgrade soils at the Thunderbird Lodge Access Loop consist mainly of clays and silts with varying amounts of sand (FHWA 2002).

The existing clayey and silty subgrade soils generally provide low support. However, the pavement designs to be utilized in the project have accounted for these soil conditions and will provide for the necessary support under the assumed traffic conditions (FHWA 2004). Ground-disturbing activities would occur under the proposed action. Substantial impacts to the geology in the project area are not anticipated and would primarily be limited to already developed areas.

Erosion control measures incorporated in the proposed action would include best management practices for drainage and sediment control. The proposed action includes the

measures described below that would reduce potential adverse impacts to geology and soils to negligible levels.

- Keep disturbed areas as small as practical to minimize exposed soil and the potential for erosion.
- Locate waste and excess excavated materials outside of drainages to avoid sedimentation.
- Install silt fences, temporary earthen berms, temporary water bars, sediment traps, stone check dams, or other equivalent measures (including installing erosion- control measures around the perimeter of stockpiled fill material) prior to construction.
- Conduct regular site inspections during the construction period to ensure that erosion- control measures were properly installed and are functioning effectively.
- Store, use, and dispose of chemicals, fuels, and other toxic materials in an appropriate manner.
- Revegetate disturbed areas as soon as possible after construction is completed.
- Pull back and stockpile in windrows no more than 3 feet high along the roadway shoulders topsoil that would require removal during construction so that it can be pulled back when work is completed. The topsoil would be supplemented with scarification, mulching, seeding, and/or planting with species native to the immediate area.

No active faults, liquefaction zones, areas with substantial landslide potential, or other geological hazards are known in the area affected by the proposed action (Arizona Geological Survey 2005; FWHA 2002). Potential impacts to geology and soils would last only as long as construction occurred and would be reduced by the measures identified above. Impacts to geologic resources and soils would be negligible and short term. No long- term impacts to geologic resources or soils are anticipated. Therefore, geology, soils, and geologic hazards are dismissed from detailed analysis.

Air Quality

The 1963 Clean Air Act, as amended (42 United States Code 7401 et seq.), requires land managers to protect air quality. Section 118 of the Clean Air Act requires parks to meet all federal, state, and local air pollution standards. Section 176(c) of the 1963 Clean Air Act requires all federal activities and projects to conform to state air quality implementation plans to attain and maintain national ambient air quality standards. Through its *Management Policies 2001* (NPS 2000; Section 4.7.1), the NPS is charged to protect air quality in all park units, and to meet the air quality standards delineated in the Clean Air Act.

Canyon de Chelly National Monument is designated as a Class II air shed under the Prevention of Significant Deterioration provisions of the Clean Air Act. Class I, II, and III areas are areas where emissions of particulate matter and sulfur dioxide are to be restricted. The restrictions are most severe in Class I areas and are progressively more lenient in Class II and III areas. The Clean Air Act does not provide strict protection of Class II areas that it affords Class I areas. However, NPS guidance recommends that park leadership and resource staff engage in decisions that may affect park air quality to minimize these effects and to invoke the NPS Organic Act when necessary as a stronger legal tool for air quality protection.

The project area is located in northern Apache County, Arizona. This area is in attainment of all federal criteria air pollutant standards (U.S. Environmental Protection Agency 2005). An area in attainment is defined as a geographic area in which levels of a criteria air pollutant (such as carbon monoxide) meet the primary national ambient air quality standard for the pollutant established under the Clean Air Act by the Environmental Protection Agency. Primary air quality standards are designed to establish limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

Overall, Canyon de Chelly National Monument does not experience any consistently poor air quality. Air quality impacts currently come from the burning of fuels and particulate matter from dirt roads prevalent throughout the Navajo Reservation and the Monument. The canyon areas within the park receive frequent vehicle traffic as a result of concessions- guided tours and incidental movement by canyon residents. Air quality emissions within the canyon rims are primarily due to vehicles on the roadway system.

Under the proposed action, local air quality would be temporarily affected by dust and construction vehicle emissions. Hauling material and operating equipment during the construction period would result in increased vehicle exhaust and emissions. Hydrocarbons, nitrogen oxide, and sulfur dioxide emissions would be expected to dissipate rapidly. Fugitive dust plumes from construction equipment would intermittently increase airborne particulates in the area near the project site, but loading rates are not expected to be considerable. The proposed action includes the measures described below that would reduce potential adverse impacts to air quality to negligible levels.

- Idling of construction vehicles would be limited to reduce construction equipment emissions.
- Contractors would be required to properly maintain construction equipment (i.e., mufflers) to minimize air emissions.
- Fugitive dust generated by construction activities would be reduced to the extent possible with regular water sprinkling of the soil during earth- disturbing activities.
- Construction debris generated during project construction would be immediately hauled from the Monument to an appropriate disposal location.
- Concrete and asphalt batch plants, if required, would be located outside of the Monument.
- Asphalt batch plants, if required, should be propane- fired (batch plants may also be fired by diesel/fuel oil or tires).

Overall, there would be a slight and temporary degradation of local air quality due to dust generated from construction activities and emissions from construction equipment. These effects would last only as long as construction occurred; impacts would be negligible and short term. No long- term impacts to air quality are anticipated. Therefore, air quality is dismissed as an impact topic in this document.

Water Quality

The 1972 Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977, is a national policy to restore and maintain the chemical, physical, and biological integrity of the nation's waters; to enhance the quality of water resources; and to prevent, control, and abate water pollution. *NPS Management Policies 2001* provide direction for the preservation, use, and quality of water in national park units.

Except in the vicinity of the Cottonwood Campground, most of the areas potentially impacted by construction activities are on the canyon rim and upland areas. Cottonwood Campground is located along Chinle Wash, which is dry in this location much of the year. There are no perennial streams or springs that would be affected by the project. Watercourses in the area are characterized by generally dry streambeds, drainages, and canyons. Flows in these streambeds, drainages, and canyons occur primarily during rain events as water runs off the impermeable slickrock areas. The proposed action would not substantially alter these streamcourses and would improve drainage along the roadway to better direct runoff flows from the roadway towards the natural drainages.

The proposed action includes the measures described below that would reduce potential adverse impacts to water quality to negligible levels.

- Water used during road construction would be purchased from outside the park.
- The erosion control measures described above for geological resources would be implemented where applicable and sediment traps, erosion check structures, and/or filters would be considered.
- All chemicals, fuels, and other toxic materials would be stored, used, and disposed of in an appropriate manner. A hazardous spill plan would be put into place, stating what actions would be taken in the case of a spill and preventive measures to be implemented, such as the placement of refueling facilities, storage, and handling of hazardous materials.
- All equipment on the project would be maintained in a clean and well-functioning state to avoid or minimize contamination from vehicle fluids. All equipment would be checked daily.

With the sediment and pollution control measures identified, the proposed action would have a negligible, short-term impact on water quality. No long-term impacts to water quality are anticipated. Therefore, water quality is dismissed as an impact topic.

Cultural Landscapes

There are no designated or managed cultural landscapes within the project area. Any elements that would contribute to a cultural landscape analysis are addressed under the Archeology and Ethnographic Resources sections of this EA.

Museum Collections

Per the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA) and NPS *Director's Order 24: Museum Collections Management*, the NPS requires the consideration of impacts on museum collections (historic artifacts, natural specimens, and archival and manuscript material) and provides further policy guidance, standards, and requirements for preserving, protecting, documenting, and providing access to, and use of, NPS museum collections. The proposed action does not affect the existing museum collections at Canyon de Chelly National Monument.

As indicated in the Alternatives section of this document, should unknown archeological or other cultural resources be discovered during project construction, work would be halted in the discovery area, and the site secured. Canyon de Chelly National Monument would consult with Navajo Tribal representatives pursuant to 36 CFR 800.13. Any artifacts collected would be delivered to Monument staff for proper handling and curation. The proposed action would not result in short- or long- term adverse impacts to museum collections. Therefore, the topic of museum collections has been dismissed from further consideration.

Socioeconomics

The Navajo tribal government has designated the town of Chinle, approximately 4.8 kilometers (3.0 miles) west of Canyon de Chelly National Monument, as one of the major “growth centers” on the reservation. It is an important trade, administrative, and educational center within the Chinle Chapter (a local government unit) and is headquarters for the Chinle Agency, one of the reservations five Bureau of Indian Affairs administrative jurisdictions (Arizona Department of Commerce 2001).

Canyon de Chelly National Monument is unique among national park system units, because it is comprised entirely of Navajo Tribal Trust Lands that remain home to the Navajo canyon community. Navajo families still inhabit the floors of the canyons, and crops continue to be cultivated. Navajo also keep sheep and goats within the canyon system. The local Navajo community is benefited by visitation and tourism through concessions, guided tours, arts and crafts, and other related activities. The proposed action has the potential to interfere with these activities and could, in the short term, result in a temporary decrease in tourism. Conversely, the proposed action would result in the creation of temporary construction jobs that may be performed utilizing the local population.

The proposed action includes the measures described below that would reduce potential adverse impacts to socioeconomics to negligible levels. These measures will ensure that access to the Monument for locals and visitors is maintained and that concessionaires will be able to operate during construction activities.

- Construction impacts will be limited to one year of work.
- Construction- caused delays to public traffic would be limited to a maximum of 5 minutes per passage on South Rim Drive from the beginning of the project to just past Thunderbird Lodge Access Road intersection. The delays would be limited to 15 minutes on the remainder of South Rim Drive.

- Access to the Visitor Center would be maintained at all times. At least 10 parking spaces would be maintained for Monument and visitor use at all times, at least 2 of which would meet Americans with Disabilities Act requirements for handicap accessibility. Ingress and egress would be maintained at all times; if the roadway is limited to one lane, adequate signing and flaggers would be provided.
- Construction- caused delays to the public would be limited to a maximum of 5 minutes per passage into and out of the Visitor's Center parking area.
- Spur road and overlook parking area closures would be limited to a maximum of one at any given time. Access for local traffic would be maintained and construction- caused delays to local traffic would be limited to a maximum of 15 minutes per passage.
- No work would be performed during the following federal holidays and surrounding days, except to maintain traffic control devices, erosion control devices, and the roadway driving surface and to control dust.
 - Martin Luther King Day: noon Friday to 6:00 a.m. Tuesday.
 - President's Day: noon Friday to 6:00 a.m. Tuesday.
 - Memorial Day Weekend: noon Friday to 6:00 a.m. Tuesday.
 - Independence Day: noon July 3 to 6:00 a.m. July 5. If July 4 falls on a weekend, Friday, or Monday, do not work the weekend.
 - Labor Day Weekend: noon Friday to 6:00 a.m. Tuesday.
 - Columbus Day: noon Friday to 6:00 a.m. Tuesday.
 - Thanksgiving: noon Wednesday to 6:00 a.m. Monday.
 - Christmas/New Year's Holiday: noon December 23 to 6:00 a.m. January 2.
 - If December 23 or January 1 falls on a Monday, do not work the adjacent weekend and do not work on December 23. If January 1 falls on a Friday, do not work the weekend.
- Appropriate traffic control measures would be implemented to ensure that emergency vehicles and personnel have continued access and priority.
- Appropriate traffic control measures would be implemented to pilot school buses through the work sites to ensure they are not subject to extensive delays.

The local community would continue to use South Rim Drive to access Chinle and the campgrounds and to provide tour and other concessionaire services. In the long term, the improvement in the roadways and other facilities, combined with a decrease in undesirable activities resulting from improved management of the overlooks and unauthorized social roads, would represent a beneficial impact to the community as these would improve visitor experience and potentially increase visitation of the Monument. Overall impacts to socioeconomics from the proposed action would be short- term and negligible during construction and long- term and beneficial after completion of construction. Therefore, the topic of socioeconomics has been dismissed from further consideration.

Environmental Justice

Presidential Executive Order 12898, "General Actions to Address Environmental Justice in Minority Populations and Low- Income Populations," requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing the disproportionately high and/or adverse human health effects due to the environmental consequences of their programs and policies on minorities and low income populations and

communities. The proposed action is the rehabilitation of existing roadways and facilities. The rehabilitation of these existing roadways and facilities would not cause a disproportionate impact on minorities or low-income populations and communities in the project area. Project construction would result in temporary, short-term, negligible impacts on concessionaire and canyon residents. In the long term, incidental benefits of the road rehabilitation would be beneficial to the community. Therefore, the topic of environmental justice has been dismissed from further consideration.

Community Services

Temporary road closures and/or restrictions during construction that would potentially occur with the proposed action could interfere with the ability of police, fire, and other community services to quickly and freely move throughout the project area. Likewise, the same potential constraints on travel could adversely affect the ability of the local residents to reach certain community services. The proposed action includes the traffic control measures described above in Socioeconomics. As part of these measures, police, fire, and other emergency vehicles would be given immediate access; no significant delays are expected for these services.

After completion of the project, community services would likely be within or relatively similar to the current range. South Rim Drive would be safer, and the overlooks and unauthorized social roads would have increased management, decreasing potential hazards and community service requirements. Overall, impacts to community services from the proposed action would be short-term and negligible during construction and long-term and beneficial after construction. Therefore, the topic of community services has been dismissed from further consideration.

Monument Operations

Effects on Monument operations from the proposed action are anticipated to be short term. Increased staff or additional equipment would not be required, nor would additional maintenance activities or law enforcement. However, roadway and other construction activities could result in minor temporary road closures and/or prevent access to areas by Monument personnel. The proposed action could temporarily impact Monument operations, such as the ability of Monument personnel to patrol, survey, and perform other maintenance activities in areas affected by construction activities. The measures identified under Socioeconomics above would reduce potential impacts to Monument operations.

The traffic control measures identified would ensure that Monument staff has continued access and priority. Access through the wire fencing along the roadways would be provided as required by Monument staff. The proposed action would reduce road repair maintenance. The roadway and intersection safety improvements, as well as the improved management of the overlooks and unauthorized social roads, could decrease the demands on Monument staff for emergency response and other law enforcement activities. In the short term, impacts to Monument operations during construction would be negligible. In the long term, impacts to Monument operations would be beneficial. Therefore, the topic of Monument operations has been dismissed from further consideration.

Transportation

Temporary road closures and/or restrictions during construction that would potentially occur with the proposed action could result in traffic delays and limit Monument access.

Reconfiguration and/or rehabilitation of the parking areas could result in diminished parking during construction. Temporary closure of overlook spur roads during rehabilitation / repaving, if they occur, could increase demand on the remaining open overlooks. In addition to the measures described above under Socioeconomics, the proposed action includes the measures described below that would reduce potential adverse impacts to transportation to negligible levels.

- If pullouts need to be closed during project construction, only one pullout would be closed at a time.
- During construction, traffic control signs and safety measures would be used to minimize hazards of construction activities. Detours and lane changes would be posted along roadways, overlooks, and campground areas to minimize impacts to visitors.

Impacts would be minimized by the project's plan to stage the closure of overlooks and areas within Cottonwood Campground and to stage work along the roadways. In the long term, after completion of the project, transportation within the Monument would be improved. Roadways would be safer, Cottonwood Campground and other parking areas would be more accessible for oversized vehicles, and intersections near the Visitor Center would be improved. The improvements to the Visitor Center parking area would enhance tour bus loading and unloading.

Overall, impacts to transportation from the proposed action would be short term and negligible. In the long term, impacts resulting from the proposed action would be beneficial. Therefore, the topic of transportation has been dismissed from further consideration.

Safety

Safety is currently affected by deteriorating pavement conditions and accident potential on South Rim Drive and the various overlook spur roads. Several portions of South Rim Drive have steep downward embankments with no shoulders or guardrails, allowing no recovery area for vehicles wandering off the road (i.e., the driver of a vehicle wandering off the road in these areas would likely lose control of the vehicle). Lack of sufficient signage and lane/traffic control at the South Rim Drive / Visitor Center, the South Rim Drive / North Rim Drive, and South Rim Drive / Thunderbird Lodge Road intersections has led to potentially dangerous traffic and pedestrian conditions. Additionally, increasing numbers of unauthorized "use" trails and roads along South Rim Drive and the spur roads have led to undesirable activities that occasionally threaten visitor and canyon resident safety.

The proposed action implements road resurfacing and rehabilitation, the addition of shoulders and guardrails at needed locations, management of unauthorized social roads, improvements to intersections near the Visitor Center, and an after- hours information kiosk at the Visitor Center. Wire livestock fencing will be installed along the road corridor. The

fencing may include 5 to 10 oversized culverts for moving livestock under the road to neighboring grazing areas. This fencing will reduce vehicle/livestock accidents, thus improving visitor and resident driving experience and safety, as well as deter the use of social pullouts. These improvements would result in noticeable improvements to safety on a local scale and would constitute a long- term, beneficial impact.

In the short term, during construction activities, workers could be subject to increased safety concerns that would be avoided through proper training and following of safety procedures. Visitors would also be subjected to increased safety concerns as a result of the road rehabilitation and associated construction hazards. These concerns would be avoided through road closures, signage, and control of traffic through the construction zone. The measures included in the proposed action for Socioeconomics and Transportation would also ensure that safety impacts to visitors, construction workers, and the public in general during construction would be negligible.

Overall, impacts to safety resulting from the proposed action would be negligible in the short term and beneficial in the long term. Therefore, the topic of safety has been dismissed from further consideration.

Floodplains

Executive Order 11988 (Floodplain Management) requires an examination of impacts to floodplains and potential risk involved in placing facilities within floodplains. NPS *Management Policies*, *Director's Order – 2: Park Planning*, and *Director's Order – 12: Conservation Planning, Environmental Impact Analysis, and Decision- Making* provide guidelines for proposed actions in floodplains. The Cottonwood Campground and the South Rim Drive / Thunderbird Lodge intersection lie within the mapped 100- year floodplain (NPS 1981). Thus, the proposed improvements to the campground and intersection also occur within the 100- year floodplain.

Per Section 4.6.4 of the NPS *Management Policies 2001* in managing floodplains on park lands, NPS will (1) manage for the preservation of floodplain values; (2) minimize potentially hazardous conditions associated with flooding; and (3) comply with the NPS Organic Act and all other federal laws and Executive Orders related to the management of activities in flood-prone areas, including Executive Order 11988 (Floodplain Management), NEPA, applicable provisions of the Clean Water Act, and the Rivers and Harbors Appropriation Act of 1899 (NPS 2000). Specifically, the Service will:

- protect, preserve, and restore the natural resources and functions of floodplains
- avoid the long- and short- term environmental effects associated with the occupancy and modification of floodplains
- avoid direct and indirect support of floodplain development and actions that could adversely affect the natural resources and functions of floodplains or increase flood risks

When it is not practicable to locate or relocate development or inappropriate human activities to a site outside and not affecting the floodplain, NPS will:

prepare and approve a statement of findings, in accordance with procedures described in Director's Order 77- 2: Floodplain Management

use non- structural measures as much as practicable to reduce hazards to human life and property, while minimizing the impact to the natural resources of floodplains

ensure that structures and facilities are designed to be consistent with the intent of the standards and criteria of the National Flood Insurance Program (44 CFR Part 60)

The proposed action would not create new impacts to floodplains. Although the Cottonwood Campground would undergo some minor configuration changes to accommodate oversized vehicles (e.g., improved turning radii and parking pads), there would be no change to the campground footprint. Proposed construction work falls outside the jurisdiction of the U.S. Army Corps of Engineers permitting requirements.

The proposed action would not make any material changes to floodplain resources, would not increase capacity, and would not increase the risk to people from floods. Therefore, short- and long- term impacts to floodplains are considered negligible. As there is no new or increased risk associated with the project improvements, the Monument would not be preparing a Statement of Findings, and the topic of floodplains has been dismissed from further consideration.

Wetlands/Streamflow/Hydrology

Executive Order 11990 (Protection of Wetlands) requires an examination of impacts to wetlands. The proposed roadway, parking area, intersection, and campground improvements are not located within any mapped jurisdictional or NPS- defined wetlands or riparian habitat (Leslie, pers. comm. 2006). The proposed project would have no short- term or long- term impacts on wetlands; therefore, wetlands are dismissed as an impact topic in the environmental assessment / assessment of effect.

The proposed action involves the rehabilitation and improvement of existing roadways and facilities. Furthermore, the proposed action would not increase the capacity of the roadways or facilities, including drainage facilities, within the Monument. As such, the proposed action would not substantially alter any stream courses or otherwise substantially affect the hydrology of the project area. The proposed drainage improvements would enhance the flow away from the road and towards existing channels.

During project construction, the use of erosion control devices as detailed in the Geology, Soils, and Geologic Hazards section above could result in short- term, negligible impacts to stream flow and hydrology. No long- term adverse impacts to streamflow or hydrology are anticipated. Thus, streamflow/hydrology is dismissed as an impact topic in the environmental assessment / assessment of effect.

Land Use

Except for a short segment west of Sliding House Overlook Road and in the vicinity of the intersection of South Rim Drive and Spider Rock Overlook Road, all of the roadway and other improvements are located within the boundaries of Canyon de Chelly National Monument

(see Figure 1). Canyon de Chelly National Monument is entirely surrounded by Navajo Tribal Trust Lands. Neither the No- action nor the Proposed Action alternatives would affect present or future Monument or tribal land uses. The proposed road reconstruction/rehabilitation would not increase the road's traffic capacity, nor would the Cottonwood Campground improvements increase the campground capacity. All roadway and other improvements would be compatible with existing and future land uses. No short- or long- term impacts to land uses are anticipated. Therefore, land use is dismissed as an impact topic in the environmental assessment / assessment of effect.

**Unique Ecosystems / Unique or Important Wildlife or Wildlife Habitat /
Unique, Essential, or Important Fish Habitat**

The National Park Service manages the natural resources of parks to maintain them in an unimpaired condition for present and future generations in accordance with NPS- specific statutes, including the NPS Organic Act and the National Parks Omnibus Management Act of 1998; general environmental laws such as the Clean Air Act, the Clean Water Act, the Endangered Species Act, the National Environmental Policy Act, and the Wilderness Act; executive orders; and applicable regulations.

The proposed action is the rehabilitation and improvement of existing roadways and facilities. These activities are confined to areas that have existing development or have been previously disturbed. Furthermore, the proposed action would not increase the capacity of the roadways or facilities within the Monument. There are no unique ecosystems; unique or important wildlife or wildlife habitat; or unique, essential, or important fish habitat within the project area (Leslie, pers. comm. 2006). Potential impacts to threatened, endangered, or special status species are discussed separately above. Consequently, the proposed action would not impact unique ecosystems; unique or important wildlife or wildlife habitat; or unique, essential, or important fish habitat. Therefore, unique ecosystems; unique or important wildlife or wildlife habitat; unique, essential, or important fish habitat are dismissed as impact topics in the environmental assessment / assessment of effect.

Prime and Unique Farmlands

All federal agencies are charged to protect prime and unique farmlands, as directed by the Council on Environmental Quality and the Farmland Protection Policy Act (7 United States Code 4201 et seq.). As directed by this Act, federal programs that contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses will be minimized. Prime or unique farmland is defined as soil that particularly produces general crops such as common foods, forage, fiber, and oil seed. Unique farmland produces specialty crops such as fruits, vegetables, and nuts. Agricultural use of lands within Canyon de Chelly National Monument has been carried on continually from ancient times to present day. However, cultivation has decreased by almost half over the last few decades. Most of the current cultivation within the Monument boundaries occurs on the canyon bottoms.

The proposed action is the rehabilitation and improvement of existing roadways and facilities. These activities are confined to areas that have existing development or have been previously disturbed. As such, the proposed action would not affect prime or unique farmlands.

Consequently, prime or unique farmlands have been dismissed as an impact topic in the environmental assessment / assessment of effect.

Energy Resources

The proposed action, which is the rehabilitation and improvement of existing roadways, would not increase the capacity of the roadways or facilities within the Monument. As such the proposed action would not affect energy resources in the project area nor would it substantially affect energy consumption. There would be no substantial adverse short- or long- term impacts to energy resources. Therefore, energy resources have been dismissed as an impact topic in the environmental assessment / assessment of effect.

ALTERNATIVES

INTRODUCTION

This section describes the two management alternatives developed for South Rim Drive and other facilities at Canyon de Chelly National Monument. Alternatives were developed to resolve issues associated with deteriorating road conditions, drop-off shoulders, inadequate parking and access, and management of overlooks and unauthorized social roads.

The No- action Alternative describes the action of continuing present management and existing conditions within the Monument. The No- action Alternative provides the basis for comparing the management direction and environmental consequences of the Preferred Alternative. The Preferred Alternative is the NPS proposed action and defines the rationale for the action in terms of visitor safety and experience, resource protection and management, operational use, and other factors. Summary tables comparing the alternatives and their ability to meet project objectives and the environmental impacts of each alternative are presented at the end of this chapter.

ALTERNATIVE 1: NO-ACTION ALTERNATIVE

The No- action Alternative would be a continuation of the existing conditions of South Rim Drive, the South Rim Drive overlook spur roads and parking areas, and other facilities in Canyon de Chelly National Monument. Pavement would be patched as needed, but the overall condition of the roadway surfaces would continue to deteriorate; parking and access to the Visitor Center, Cottonwood Campground, and White House Overlook would continue to be limited and/or restricted; and existing unauthorized social roads along South Rim Drive and the overlook spur roads would continue to be used.

Implementation of the No- action Alternative means that the overall rehabilitation of South Rim Drive and the overlook spur roads would not occur. Turning radii within the Visitor Center parking area and the Cottonwood Campground would continue to be inadequate for oversized vehicles and buses. Parking at the White House Overlook would remain limited, continuing the unauthorized parking along the roadway shoulders. The Monument would continue routine spot repairs and accident responses.

ALTERNATIVE 2: PREFERRED ALTERNATIVE

Alternative 2, the NPS Preferred Alternative, meets the NPS objective of enhancing visitor experience while providing safe and efficient accommodation of Monument visitors along South Rim Drive, the spur roads, and other facilities.

General Description of Road Rehabilitation Work

The proposed project would involve improvements to South Rim Drive, Sliding House Overlook Road and parking area, White House Overlook Road and parking area, Tunnel Overlook parking area, Tsegi Overlook parking area, Junction Overlook Road and parking area, the Visitor Center parking area, Spider Rock Overlook parking area, and Spider Rock

Overlook Road. Access gates would be installed at overlook parking entrances and at the Visitor Center parking entrance that can be closed after hours to enhance management options for overnight use. Existing pavement widths and speed limits (e.g., 45 miles per hour on South Rim Drive except between the Visitor Center and Thunderbird Lodge Road where the speed limit is 25 miles per hour) would remain unchanged.

Roadways and parking areas would be repaved using full- depth reclamation with cement and hot asphalt concrete pavement. The depth of the reclamation and the thickness of the new pavement would vary by roadway segment. A short section of South Rim Drive would be repaved with hot asphalt concrete pavement without the full- depth reclamation. The recently rehabilitated Sliding House Overlook Road and parking and Junction Overlook Road and parking would be chip sealed to prolong the life of the roadways. Spider Rock Overlook Road and parking area would also receive a chip seal as a part of this action.

The intersections of South Rim Drive and the Visitor Center, the intersection of South Rim Drive and North Rim Drive, and the intersection of South Rim Drive and Thunderbird Lodge Road call for some minor roadway widening and re- striping to allow for turning lanes. The specific intersection improvements are discussed below.

Three areas along South Rim Drive requiring improvements to the clear zone would be flattened and guardrails would be installed to improve the recovery zone adjacent to the roadway. A 1V:3H slope (i.e., a 1- foot rise in elevation over a 3- foot distance) would be used on long fill slopes. Improvements would be made to curbs and gutters, culverts, and existing drainage ditches adjacent to the roadway.

White House Overlook Parking Area

In addition to the rehabilitation of the roads and overlook parking areas, 18 additional automobile and oversized vehicle parking spaces are proposed. Sidewalks and railings would be installed along the northwest area of the overlook loop road. The improvements are generally confined to already disturbed areas and will tie into the existing parking facilities.

Visitor Center Parking Area

Basic improvements to the Visitor Center parking lot circulation geometry and parking stalls would be made to better accommodate oversized vehicles and buses. The improvements include expanded bus parking along the western portion of the parking lot loop, improved turning radius at the south end of the parking lot, and expanded vehicle and oversized vehicle parking along the eastern portion of the parking lot loop. Four handicap parking spaces would be added to the Visitor Center with associated ramps. Also included are improved sidewalks and pedestrian access. These improvements are generally confined to already disturbed areas. An access gate would be installed at the Visitor Center parking area entrance that can be closed after hours. A new after- hours visitor information kiosk would be constructed to the west of the Visitor Center parking entrance near the proposed gate for use when the Visitor Center is closed.

Thunderbird Lodge Parking Area

The parking area at the Thunderbird Lodge would be refurbished and rehabilitated. The existing pavement would be replaced and re- striped to match the existing markings.

Cottonwood Campground Improvements

The Cottonwood Campground road consists of a short two- lane, two- way entrance road that branches into three one- lane, one- way loops. The loops provide access to 93 oversized vehicle accessible campsites. The tight horizontal curves, intersection radii, and narrow roadway width make it difficult for oversized vehicles to maneuver through the entrance and loop roads. The current layout of the intersection radii does not provide for an oversized vehicle to turn left from the loop roads onto the entrance road.

The widths of both the entrance road and the loop roads vary. The proposed action would include pavement rehabilitation, campsite parking pad improvements, Americans with Disabilities Act compliance, and widening of roadways. In order to improve traffic flow through Cottonwood Campground, radii at intersections would be increased and roadways widened to meet at least the minimum standards.

All sites would be improved to accept an oversized vehicle and car or an oversized vehicle. Unless this guideline adversely affects other sites and/or existing trees, all pads would be lengthened to 15.2 meters (50 feet). If existing trees do not allow the recommended design, the following lengths would be used in the order they are presented: 13 meters (42.5 feet) to allow car and trailer, 10 meters (30 feet) to allow an oversized vehicle, and no modification, allowing the existing condition accepting only a car. The plan calls for the removal of some existing sites, the creation of others, the designation of the appropriate number of Americans with Disabilities Act accessible sites, and the removal of some trees. In total, four sites would be removed: sites 25, 27, 28, and 45. To offset the loss of these sites, three new sites would be constructed: designated sites 35B, 70B, and 84B. Approximately 8 non- native or already damaged trees would be removed. Pavement removed from the roadway would be recycled and the area would be overlaid with asphalt.

South Rim Drive / Visitor Center Entrance Intersection Improvements

This intersection is a “T” intersection with South Rim Drive the “through” direction. Currently, there is a striped right- turn lane on South Rim Drive for eastbound traffic turning into the Visitor Center and a striped left- turn lane on South Rim Drive for westbound traffic turning into the Visitor Center. There is a stop sign for traffic leaving the Visitor Center. There are no pedestrian crossings at this intersection.

The proposed action would add a raised median with a pedestrian crosswalk and pedestrian refuge west of the intersection. The median at the entrance to the Visitor Center would be reconfigured to improve circulation. Rumble strips would be constructed under the centerline stripe. South Rim Drive and the Visitor Center entrance would be re- striped at this intersection, and new signage would be added. These improvements would result in minimal widening of the roadways.

South Rim Drive / North Rim Drive Intersection Improvements

Currently, the intersection of South Rim Drive and North Rim Drive is a “T” intersection with no turning lanes. South Rim Drive is the “through” direction. There is a stop sign for southbound traffic on North Rim Drive at the intersection. There are no pedestrian crossings at this intersection.

The proposed action would reconfigure southbound North Rim Drive at the intersection to create a right- turn lane and a left- turn lane with a raised median. Westbound South Rim Drive would be reconfigured to add a right- turn lane for traffic turning onto North Rim Drive. The existing eastbound left- turn lane for traffic turning off of South Rim Drive onto North Rim Drive would be lengthened. Both roadways would be re- striped at this intersection, and new signage would be added to reflect these circulation improvements. These improvements would result in minimal widening of the roadways.

South Rim Drive / Thunderbird Lodge Road Intersection Improvements

Currently, the intersection of South Rim Drive and Thunderbird Lodge Road / Canyon Entrance Road is a two- way stop; South Rim Drive is the “through” direction with no turn lanes. There are no pedestrian crossings. The Canyon Entrance Road is unpaved (dirt) and provides access to the canyon for the concessionaire tour vehicles, local tour companies, local residents, and park service employees.

Two different options are being considered for improving safety at this intersection as follows:

Option 1. This option would add either left- turn lanes for both east- and westbound traffic on South Rim Drive or a right- turn lane for eastbound traffic on South Rim Drive turning onto Thunderbird Lodge Road. The Canyon Entrance leg of the intersection would be paved for a short distance and also realigned so that it would be straight across from the Thunderbird Lodge Road leg. The intersection would incorporate a new pedestrian crossing across from South Rim Drive. This option would also relocate the driveway access from South Rim Drive, southeast corner, to a location south of the main intersection on Thunderbird Lodge Road. Fencing would be added in order to limit access to the area alongside South Rim Drive and ending at the newly relocated driveway access.

The roadways would be re- striped at this intersection and new signage would be added to reflect these circulation and pedestrian improvements. These improvements would result in minimal widening of the roadways.

Option 2. This option would add a pedestrian crossing across South Rim Drive and would pave the Canyon Entrance leg of the intersection for a short distance but would not add any turn lanes as described under Option 1. Additionally, this option would add fencing along the open area to the east of the intersection to limit access but would retain access to the unpaved road. A stop sign would be added to the unpaved access road for traffic pulling out onto South Rim Drive.

The roadways would be re-stripped at this intersection and new signage would be added to reflect these circulation and pedestrian improvements. These improvements would result in no widening of the roadways.

Management of Unauthorized Social Roads

There are approximately 300 roads that fall into the criteria of unpaved two-tracks without a determined and useful destination on the South Rim of Canyon de Chelly National Monument (“unauthorized social road”). These roads serve as a conduit for exotic species and result in damage to archeological and historic sites, soils, culturally significant plants, and other biota. Consultations between local residents, the Navajo Tribe, and Monument staff would result in an inventory and evaluation of the roads that may be permanently removed from use.

Roads that would be permanently removed from use would be closed and reclaimed by rocks, livestock fencing, planting of native vegetation, gates, or other methods that would blend in with the natural environment.

Additional Project Features

Wire fencing would be strung along the length of the project on both sides of the roads to protect livestock, residents, and visitors, as well as to deter use of social pullouts. Wildlife-friendly cattle guards, designed to provide trapped wildlife an outlet on one side, may be installed at both ends of the project. Access would be maintained to residences and livestock areas, as well as to those unauthorized social roads that are not identified for closure, through breaks in the fencing. Five to ten oversized culverts may be added to allow for livestock movement from one grazing area to another. The locations will be determined through consultation between the road engineer, local residents, and the NPS.

Staging areas have not been identified at this point of project planning, but based on experiences from past projects in the Monument, the NPS would specify that the contractor stage their construction in previously disturbed areas away from visitor use to the extent possible. Possible staging areas could include pullouts and overlooks.

A traffic control plan would be developed by the FHWA and adhered to during construction by the contractor. The FHWA would prepare traffic maintenance options in an effort to determine the most desirable method of maintaining traffic during construction. The kinds of issues that would be considered when identifying options would be visitor access to areas, resident’s access to their homes and livestock, and natural and cultural resources access and protection.

Announcement through public release to radio stations, press, publications, other public information outlets, and Web sites, as appropriate, would be used as needed. The contractor would also provide daily delay schedules, variable message boards coordinated with the FHWA’s project engineer, and temporary construction signs in and outside the Monument.

MITIGATION MEASURES

Mitigation measures are presented as part of the Preferred Alternative. These actions have been developed to lessen or eliminate the potential adverse effects on the human environment resulting from implementation of the Preferred Alternative.

Resource Area	Mitigation
General Considerations	The NPS project manager would ensure that the project remains confined within the parameters established in the compliance documents and that mitigation measures are properly implemented.
	Construction zones outside of the existing disturbed areas would be identified and fenced with construction tape or some similar material prior to any construction activity. The fencing would define the construction zone and confine activity to the minimum area required for construction.
	All protection measures would be clearly stated in the construction specifications, and workers would be instructed to avoid conducting activities beyond the construction zone, as defined by the construction zone fencing. This does not exclude necessary temporary structures such as erosion control fencing.
	All tools, equipment, barricades, signs, surplus materials, and rubbish would be removed from the project work limits upon project completion. Any asphalt surfaces damaged due to work on the project would be repaired to original condition. All demolition debris would be removed from the project site, including all visible concrete and metal pieces.
	Fugitive dust generated by construction activities would be reduced to the extent possible with regular water sprinkling of the soil during earth-disturbing activities.
	Idling of construction vehicles would be limited to reduce construction equipment emissions.
	Contractors would be required to properly maintain construction equipment (i.e., mufflers) to minimize noise and air emissions.
	All chemicals, fuels, and other toxic materials would be stored, used, and disposed of in an appropriate manner.
	A hazardous spill plan would be in place, stating what actions would be taken in the case of a spill and preventive measures to be implemented, such as the placement of refueling facilities, storage, and handling of hazardous materials, etc.
	All equipment on the project would be maintained in a clean and well-functioning state to avoid or minimize contamination from vehicle fluids; all equipment would be checked daily.
	Wire livestock fencing installed along the road corridor is to be wildlife friendly, meaning that the bottom wires are to be barbless.
	Access to residences and livestock areas, as well as to those unauthorized social roads that are not identified for closure, would be maintained as required through breaks in the fencing along the roadways.
	A traffic control plan would be developed by the FHWA and adhered to during construction by the contractor. The FHWA would prepare traffic maintenance options in an effort to determine the most desirable method of maintaining traffic during construction. The kinds of issues that would be considered when identifying options would be visitor access to areas, resident's access to their homes and livestock, and natural and cultural resources access and protection.
	Announcement through public release to radio stations, press, publications, other public information outlets, and Web sites, as appropriate, would be used as needed. The contractor would also provide daily delay schedules, variable message boards coordinated with the FHWA's project engineer, and temporary construction signs in and outside the Monument.
Wildlife	The contractor would be required to maintain strict garbage control so that scavengers (e.g., corvids) are not attracted to the project area. No food scraps would be discarded or fed to wildlife.
	Potential roadside habitat for small wildlife species consisting of downed trees and rock piles would be replaced upon completion of project construction activities.

Resource Area	Mitigation															
Wildlife (continued)	Any project-related vehicle or equipment operating on unpaved roads would not exceed a speed limit of 40 kilometers per hour (25 miles per hour).															
	Cross-country (off-road) travel would not be authorized, except under life-threatening / emergency situations.															
	The field contact representative would conspicuously stake, flag, or mark work area boundaries to minimize surface disturbance to the surrounding habitat. Material stockpiling, machinery storage, and vehicle parking would only be permitted in designated areas.															
	No feeding of feral dogs or cats, or other domestic animals would be allowed.															
	Contractors working in the Monument would be given orientation concerning proper conduct of operations. This orientation would be provided in both written form and verbally (at a preconstruction meeting). Orientation topics include: <ul style="list-style-type: none">• Wildlife should not be approached or fed.• Collection or damage of any park resources, including wood, rocks, artifacts, plants and animals, is strictly prohibited.• Contractor must have a safety policy, and hazardous waste and spills policy in place and follow it.															
Threatened and Endangered Species / Species of Special Concern	Prior to the initiation of construction activities, a qualified biologist or appropriate Monument staff shall survey the project area to determine the presence or absence of Mexican spotted owl, golden eagle, peregrine falcon, ferruginous hawk, bald eagle, southwestern willow flycatcher, and California condor per the guidelines outlined in the following paragraphs. Surveys of species habitat would follow all aspects of standard protocols. Based on the results of these surveys, the following conservation measures would be implemented as appropriate. If species are not present, construction activities may continue subject to the conditions outlined below.															
	<p>Mexican Spotted Owl (MSO), Golden Eagle, Peregrine Falcon, Ferruginous Hawk, Bald Eagle</p> <ul style="list-style-type: none">• If the project occurs within a Protected Activity Center (PAC) with no known nest site, all construction activity would be restricted to the non-breeding season. However, if the project in a PAC is at least the distance specified below from known nest sites and the project does not include blasting, the project can be implemented during the breeding seasons. <table><tr><th>Species</th><th>Minimum Distance (kilometer [mile])</th><th>Breeding Season</th><th>Non-Breeding Season</th></tr><tr><td>MSO</td><td>0.8 (0.5)</td><td>March 1 to August 31</td><td>September 1 to February 28</td></tr><tr><td>Golden eagle, peregrine falcon, ferruginous hawk</td><td>1.2 (0.75)</td><td>February 1 to August 31</td><td>September 1 to January 31</td></tr><tr><td>Bald eagle</td><td>1.2 (0.75)</td><td>December 1 to June 30</td><td>July 1 to November 30</td></tr></table> <ul style="list-style-type: none">• If the project occurs outside of a PAC, but within 1 mile of a known PAC nest or roost site, or the boundary of a PAC where the nest or roost site is not known, or unsurveyed restricted, protected, or predicted habitat, all blasting in that project area would be restricted to the non-breeding season:<ul style="list-style-type: none">○ MSO: September 1–February 28○ Golden eagle, peregrine falcon, ferruginous hawk: September 1–January 31○ Bald eagle: July 1–November 30	Species	Minimum Distance (kilometer [mile])	Breeding Season	Non-Breeding Season	MSO	0.8 (0.5)	March 1 to August 31	September 1 to February 28	Golden eagle, peregrine falcon, ferruginous hawk	1.2 (0.75)	February 1 to August 31	September 1 to January 31	Bald eagle	1.2 (0.75)	December 1 to June 30
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ALTERNATIVES

Resource Area	Mitigation
Threatened and Endangered Species / Species of Special Concern (continued)	<ul style="list-style-type: none"> • If the project occurs outside of a PAC, but within 0.8 kilometer (0.5 mile) of a known PAC nest or roost site, or the boundary of a PAC where the nest or roost site is not known, or unsurveyed restricted, protected, or predicted habitat, light and heavy construction activity (as defined below) in that project area would be restricted to the non-breeding season: <ul style="list-style-type: none"> ○ MSO: September 1–February 28 ○ Golden eagle, peregrine falcon, ferruginous hawk: September 1–January 31 ○ Bald eagle: July 1–November 30 • If the project is more than 0.4 kilometer (0.25 mile) from the situations outlined above, light construction activity (as defined below) can occur at any time.
	<p>Nesting Bald Eagles (in addition to above measures)</p> <ul style="list-style-type: none"> • No adverse changes to the landscape or increased access will occur within the boundaries of any existing or planned Nesting Bald Eagle Area. Closures will be placed around any bald eagle nests discovered in the project area. • If by March 31, the breeding pair is not occupying the breeding area or the specific nest a closure protects, or the pair in an occupied breeding area does not lay eggs in a nest within the closure, then the closure can be lifted and the area opened to activity. • If the pair lays eggs but the breeding attempt fails, the closure can be opened if the pair does not double clutch within 45 days after the failure. • If a new breeding area or new nest in a known breeding area is discovered (not within the current closure), the land manager will discuss the need to develop a new closure or adjust the boundaries of the current closure. • Annual winter surveys of bald eagles within the project area and the park would continue according to established protocol.
	<p>Southwestern Willow Flycatcher</p> <ul style="list-style-type: none"> • Emergency closures would be placed at all known or suspected southwestern willow flycatcher nest sites (with a 0.8-kilometer [0.5-mile] buffer). These closures would be in place from May 1 to July 15 and include closure of visitor use, including hiking, camping, construction, and exotic plant removal activity. • Annual surveys of suitable southwestern willow flycatcher habitat within the project area and the park would continue.
	<p>California Condors</p> <ul style="list-style-type: none"> • If condor nesting activity is discovered within 1.6 kilometers (1 mile) of the project area, project activity will be restricted during the active nesting season (February 1 to November 30). • If condor nesting activity is known within 0.8 kilometer (0.5 mile) of the project area, light and heavy construction (as defined below) in the project area will be restricted during the active nesting season (February 1 to November 30). • If a condor occurs at the project site, project activity will cease until the condor leaves on its own or until techniques resulting in the condor leaving the area are employed by permitted personnel. • The site will be cleaned up at the end of each working day in order to minimize the likelihood of condors visiting the site.

Resource Area	Mitigation
Threatened and Endangered Species / Species of Special Concern (continued)	<p data-bbox="483 243 860 270">Definitions of Construction Activities</p> <ul style="list-style-type: none"> <li data-bbox="483 279 1409 772"> <p data-bbox="483 279 732 306">• Heavy Construction</p> <p data-bbox="532 310 1357 369">Heavy construction would require the use of large equipment for actions such as earthmoving, rock excavating, and building construction.</p> <ol style="list-style-type: none"> <li data-bbox="532 373 1409 512">1. Earthmoving: Earthmoving activities would require the use of heavy equipment such as large bulldozers, scrapers, and excavators for moving large areas of soil and rocks. This activity would be typical of construction of large facilities or roads where large areas of cut and fill would be manipulated (these are rare situations). <li data-bbox="532 550 1409 772">2. Rock excavation, including trenching (does not include blasting): Work involving rock excavating and trenching would typically require the use of heavy equipment such as hoe-rams, rock saws, hammer hoes, rippers on bulldozers, and large trackhoes with hydraulic hammers. This type of activity would be used for utility lines and foundations where rock is present. The operation of the equipment necessary to excavate rock can be very loud and can also result in vibration. The sound generated from the rock excavation itself can also be very loud. <li data-bbox="483 781 1409 1205"> <p data-bbox="483 781 721 808">• Light Construction</p> <p data-bbox="532 812 1409 1205">Light construction is defined as those construction activities that are not described above for heavy construction. Typically light construction activities would require smaller pieces of equipment that do not typically generate as much noise as those activities listed for heavy construction. Light construction would include such activities as road rehabilitation and maintenance that does not require the use of heavy earthmoving equipment, trenching in dirt (not rock), concrete work, earthwork that does not involve heavy earthmoving equipment, trail construction (if it does not require the use of heavy earthmoving equipment or rock excavation), and building construction of two stories or less (that would not require a crane). Typical equipment that would be used for these types of activities include backhoes, small dump trucks, chainsaws, jackhammers, small bulldozers, bobcats, pavers, small base/soil compactors, punjars, and graders. Blasting, the use of large earthmoving equipment, and the use of very loud equipment (like rocksaws and hoe-rams) would not be used during light construction activities.</p> <li data-bbox="483 1213 1409 1871"> <p data-bbox="483 1213 613 1241">• Blasting</p> <p data-bbox="532 1245 1409 1633">In general the purpose of blasting is to fracture materials so that they can be more easily excavated or removed. Blasting is done in two primary ways: (1) uncontained blasting, where materials may be ejected from the immediate area, such as is often done for mining purposes and (2) contained blasting, which occurs underground and where material is not ejected from the blast site. This second type of blasting is the most common type used in national parks. This type of blasting is considered an option for projects where deemed necessary and appropriate. This type of blasting would typically result in a muffled roar and ground vibration. Typically, the contractor would drill to the depth of the excavation in a grid pattern, insert the proper amount of explosive for the depth desired, and then provide a protective cover (blasting mat or earth fill) over the area of the blast. When the blast occurs, the ground would rise slightly in the area, then return to about ground level. The desired excavation limits would be developed by the blast and a backhoe or shovel would be used to remove the material. The result is typically a neat, clean excavation in the rock.</p> <p data-bbox="532 1638 1409 1871">Blasting is usually only permitted by NPS if other tools are impractical or as a last resort. NPS will restrict blasting for a variety of reasons such as proximity to visitor/employee areas, proximity to resident's homes or other structures, and proximity to sensitive resources. Blasting would only be used for a project when it is considered the best tool for the job by the contractor and is permitted by the NPS. A blast could be loud but would last only milliseconds. All blasting would be conducted in accordance with Director's Order 65 (Explosives Use and Blasting Safety) and a blasting safety plan would be developed prior to implementation.</p>

ALTERNATIVES

Resource Area	Mitigation
Vegetation	For much of the corridor, revegetation work would be minimized because construction would be completed in previously disturbed areas of the roadway template. Staging areas would utilize previously disturbed sites such as parking lots.
	Revegetation work would use soil conserved along the corridor and native species from genetic stocks originating in Canyon de Chelly National Monument. Revegetation efforts would also attempt reconstruction of the natural spacing, abundance, and diversity of native plant species.
	Vegetation impacts and potential compaction and erosion of bare soils would be minimized by replacement of topsoil in as near the original location as possible, scarification, mulching, and seeding/planting with species native to the immediate area.
	Reclaimed areas would be monitored after construction to determine if reclamation efforts are successful or if additional remedial actions are necessary.
	Remedial actions could include installation of erosion-control structures, reseeding and/or replanting the area, and controlling non-native plant species.
	In an effort to avoid introduction of non-native/noxious plant species, no imported topsoil or hay bales would be used during revegetation. On a case-by-case basis the following materials may be used for any erosion-control dams that may be necessary: certified weed-free rice straw, cereal grain straw that has been fumigated to kill weed seed, and wood excelsior bales.
	Undesirable plant species would be monitored and controlled as necessary. To prevent the introduction and minimize the spread of non-native vegetation and noxious weeds, the following measures would be implemented during construction: <ul style="list-style-type: none"> • Treat existing populations of exotic vegetation at the construction site prior to construction activities. • Minimize soil disturbance. • Pressure wash and/or steam clean all construction equipment to ensure that all equipment, machinery, rocks, gravel, or other materials are cleaned and weed free before entering Canyon de Chelly National Monument. • Cover all trucks hauling asphalt or other fill materials from outside the monument to prevent seed transport. • Have the location of the staging area for construction equipment park-approved and treated for exotic vegetation. • Limit vehicle parking to existing roadways, parking lots, access routes, or the staging area. • Limit disturbance to roadsides and culvert areas, including limiting equipment to the roadbed area; no machinery or equipment should access areas outside the construction zone. • Obtain all fill, rock, or additional topsoil from the project area, if possible. If not possible, obtaining weed-free sources from NPS approved sources outside the monument would be required. • Initiate revegetation of disturbed sites immediately following construction activities using site adapted native seed and/or plants. • Monitor disturbed areas following construction to identify growth of noxious weeds or non-native vegetation. Treatment of non-native vegetation would be completed in accordance with NPS-13, <i>Integrated Pest Management Guidelines</i>. Monitoring and follow-up treatment would occur for two to three years after construction is completed.
Geology, Soils, and Geologic Hazards	Keep disturbed areas as small as practical to minimize exposed soil and the potential for erosion.
	Locate waste and excess excavated materials outside of drainages to avoid sedimentation.
	Install silt fences, temporary earthen berms, temporary water bars, sediment traps, stone check dams, or other equivalent measures (including installing erosion-control measures around the perimeter of stockpiled fill material) prior to construction.
	Conduct regular site inspections during the construction period to ensure that erosion-control measures were properly installed and are functioning effectively.

Resource Area	Mitigation
Geology, Soils, and Geologic Hazards (continued)	Store, use, and dispose of chemicals, fuels, and other toxic materials in an appropriate manner.
	Revegetate disturbed areas as soon as possible after construction is completed.
	Pull back and stockpile along the roadway shoulders topsoil that would require removal during construction so that it can be pulled back when work is completed. The topsoil would be supplemented with scarification, mulching, seeding, and/or planting with species native to the immediate area.
Air Quality	Construction debris generated during project construction would be immediately hauled from the Monument to an appropriate disposal location.
	Concrete and asphalt batch plants, if required, would be located outside of the Monument.
	Asphalt batch plants, if required, should be propane-fired (batch plants may also be fired by diesel/fuel oil or tires).
Water Quality	Water used during road construction would be purchased from outside the park.
	The erosion control measures described above for Geology, Soils, and Geologic Hazards would be implemented where applicable and sediment traps, erosion check structures, and/or filters would be considered.
	All equipment on the project would be maintained in a clean and well-functioning state to avoid or minimize contamination from vehicle fluids. All equipment would be checked daily.
Socioeconomics	Construction impacts will be limited to one year of work.
	Construction-caused delays to public traffic would be limited to a maximum of 5 minutes per passage on South Rim Drive from the beginning of the project to just past Thunderbird Lodge Access Road intersection. The delays would be limited to 15 minutes on the remainder of South Rim Drive.
	Access to the Visitor Center would be maintained at all times. At least 10 parking spaces would be maintained for Monument and visitor use at all times, at least 2 of which would meet Americans with Disabilities Act requirements for handicap accessibility. Ingress and egress would be maintained at all times; if the roadway is limited to one lane, adequate signing and flaggers would be provided.
	Construction-caused delays to the public would be limited to a maximum of 5 minutes per passage into and out of the Visitor's Center parking area.
	Spur road and overlook parking area closures would be limited to a maximum of one at any given time. Access for local traffic would be maintained and construction-caused delays to local traffic would be limited to a maximum of 15 minutes per passage.
	No work would be performed during the following federal holidays and surrounding days, except to maintain traffic control devices, erosion control devices, and the roadway driving surface and to control dust.
	<ul style="list-style-type: none"> • Martin Luther King Day: noon Friday to 6:00 a.m. Tuesday. • President's Day: noon Friday to 6:00 a.m. Tuesday. • Memorial Day Weekend: noon Friday to 6:00 a.m. Tuesday. • Independence Day: noon July 3 to 6:00 a.m. July 5. If July 4 falls on a weekend, Friday, or Monday, do not work the weekend. • Labor Day Weekend: noon Friday to 6:00 a.m. Tuesday. • Columbus Day: noon Friday to 6:00 a.m. Tuesday. • Thanksgiving: noon Wednesday to 6:00 a.m. Monday. • Christmas/New Year's Holiday: noon December 23 to 6:00 a.m. January 2. • If December 23 or January 1 falls on a Monday, do not work the adjacent weekend and do not work on December 23. If January 1 falls on a Friday, do not work the weekend.
	Appropriate traffic control measures would be implemented to ensure that emergency vehicles and personnel have continued access and priority.
	Appropriate traffic control measures would be implemented to pilot school buses through the work sites to ensure they are not subject to extensive delays.
Community Services	Same as Socioeconomics
Monument Operations	Same as Socioeconomics

ALTERNATIVES

Resource Area	Mitigation
Transportation	Same as Socioeconomics
	If pullouts need to be closed during project construction, only one pullout would be closed at a time.
	During construction, traffic control signs and safety measures would be used to minimize hazards of construction activities. Detours and lane changes would be posted along roadways, overlooks, and campground areas to minimize impacts to visitors.
Safety	Same as Socioeconomics and Transportation
Soundscapes	Work hours would be from dawn to dusk to minimize resident and visitor disturbance after dark.
	The limitation on work during the holidays specified for the proposed action under Socioeconomics above will also serve to minimize impacts to soundscapes.
Visitor Use and Experience	Implementation of the Socioeconomic and Transportation mitigation measures will also serve to lessen impacts to visitor experience.
	Work hours would be from dawn to dusk to avoid the increased potential for accidents and visitor disturbance after dark.
Archeology	Archeological monitoring and/or temporary fencing or flagging would be implemented during construction in the vicinity of known archeological resources to assure that activities and equipment do not stray out of previously disturbed areas.
	Should unknown archeological or other cultural resources be discovered during construction, work would be halted in the discovery area and the site secured. Canyon de Chelly National Monument would consult with Navajo Tribal representatives pursuant to 36 CFR 800.13.
	Archeological specimens found within the construction area would be removed only by the NPS or their designated representatives.
	In compliance with the NAGPRA of 1990, NPS would consult with Navajo tribal representatives for the proper treatment of human remains, funerary, and sacred objects should these be discovered during the project.
	Eligible archaeological resources will be avoided in the unauthorized social road closure process through coordination with an NPS archeologist.
	Fencing proposed along the roadways will be placed in previously disturbed areas within the road corridor or in other ways to avoid eligible archeological resources. In the vicinity of eligible archeological sites, the fence location will be determined by an NPS archeologist and road engineer in coordination with other appropriate staff and/or interested parties.
Historic Structures	Monitoring and/or temporary fencing or flagging would be implemented during construction in the vicinity of known historic structures to assure that activities and equipment do not stray out of previously disturbed areas.
	Should unknown historic resources be discovered during construction, work would be halted in the discovery area and the site secured. Canyon de Chelly National Monument would consult with Navajo Tribal representatives pursuant to 36 CFR 800.13.
	Fencing proposed along the roadways will be placed in previously disturbed areas within the road corridor or in other ways to avoid eligible historic structures. In the vicinity of eligible historic structures, the fence location will be determined by an NPS archeologist and road engineer in coordination with other appropriate staff and/or interested parties.
Ethnographic Resources	Design of the White House Overlook parking area expansion would be prepared with sensitivity to Navajo concerns to ensure access to those areas of special spiritual and ceremonial significance located in the vicinity.
	Known ethnographic resources would be avoided in the unauthorized social road closure process through coordination with an NPS archeologist and Navajo representatives.
	Fencing proposed along the roadways will be placed in previously disturbed areas within the road corridor or in other ways to avoid known ethnographic resources. In the vicinity of known ethnographic resources, the fence location will be determined by an NPS archeologist, road engineer, and Navajo representatives in coordination with other appropriate staff and/or interested parties.
Local Community	Implementation of the Socioeconomic and Transportation mitigation measures will also serve to lessen impacts to the local community.
	Work hours would be from dawn to dusk to avoid the increased potential for accidents and community disturbance after dark.

Resource Area	Mitigation
Local Community (continued)	Unauthorized social roads that would be closed and obliterated would be identified through consultations between the Monument and the local community. Roads not agreed to for closure between the Monument and the local community would remain in their current state.
	Access to residences and livestock areas, as well as to those unauthorized social roads that are not identified for closure, would be maintained as required through breaks in the fencing along the roadways.

ALTERNATIVES CONSIDERED BUT DISMISSED

The proposed action is a basic roadway repaving project. The alternative to repaving the road is to not repave the road, which is the No- action Alternative. Consequently, no other alternatives to the proposed action were considered.

ENVIRONMENTALLY PREFERRED ALTERNATIVE

In accordance with Director's Order 12, NPS is required to identify the environmentally preferred alternative in all environmental documents, including environmental assessments. The environmentally preferred alternative is determined by applying the criteria suggested in NEPA. The environmentally preferred alternative is (NPS 2005a):

. . . the alternative that will promote the national environmental policy expressed in NEPA (Section 101(b)). This includes alternatives that:

1. Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.
2. Ensure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings
3. Attain the widest range of beneficial uses of the environment without degradation, risk 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.
6. Enhance the quality of renewable resources and approaching the maximum attainable recycling of depletable resources.

The No- action Alternative is not the environmentally preferred alternative because it would not:

address the deteriorating road surfaces and roadway and intersection geometry deficiencies that create safety hazards for employees and visitors (Criteria 2 and 3 not met)

reduce the need for road maintenance that consumes depletable resources (Criteria 1 and 6 not met)

improve access to Monument facilities (e.g., Visitor Center, Cottonwood Campground, etc.) for all individuals (Criteria 2 and 4 not met)

improve protection of Monument resources and public safety as it would not manage access to and activities associated with unauthorized social roads and pullouts (Criteria 1, 2, 3, and 4 not met)

The environmentally preferred alternative in this environmental assessment / assessment of effect is the NPS Preferred Alternative. This alternative was selected based on the following criteria:

It protects public and employee health, safety, and welfare by addressing safety concerns associated with deteriorated road surfaces, inadequate clear zones, undesirable activities at overlooks and unauthorized social roads, and poor intersections while selecting a design that minimizes the impacts to the natural and cultural environment of Canyon de Chelly National Monument (Criteria 2, 3, and 5).

It reduces damage to natural and cultural resources by providing better management of unauthorized turnouts and roads (Criteria 1, 3, and 4).

It improves operational efficiency and sustainability by reducing the need for ongoing road maintenance and the consumption of depletable resources associated with such maintenance (Criteria 1 and 6).

It improves access to Monument facilities for today's larger oversized vehicle and buses by addressing inadequate roadway geometries (e.g., turning radii) and parking facilities (Criteria 3 and 5).

Sustainability

NPS has adopted the option of sustainable design as a guiding principle of facility planning and development. The objectives of sustainability are to design park unit facilities to minimize adverse effects on natural and cultural values, to reflect their environmental setting, and to maintain and encourage biodiversity; to construct and retrofit facilities using energy-efficient materials and building techniques; to operate and maintain facilities to promote their sustainability; and to illustrate and promote conservation principles and practices through sustainable design and ecologically sensitive use. Essentially, sustainability is living within the environment with the least impact on the environment. The NPS Preferred Alternative subscribes to and supports the practice of sustainable planning, design, and use of the roadways and facilities within Canyon de Chelly National Monument.

General Construction Schedule and Costs

It is anticipated that the NPS Preferred Alternative would be constructed in 2006 with an estimated cost ranging from 6 to 8 million dollars. Project construction is anticipated to occur in fiscal year 2009.

COMPARATIVE SUMMARY OF NO-ACTION AND PREFERRED ALTERNATIVES

No-Action Alternative	Preferred Alternative
<p>The No-action Alternative would be a continuation of the existing roadway conditions along South Rim Drive and other roadways and overlooks within Canyon de Chelly National Monument. The roadways would continue to have aging and deteriorating surfaces. Road shoulders and guardrails would continue to be inadequate along sections of South Rim Drive. Intersections in the vicinity of the Visitor Center/Monument headquarters would continue to have safety concerns. Oversized vehicle parking capacity and access would continue to be limited at the Visitor Center, Cottonwood Campground, and the White House Overlook. Insufficient management of unauthorized social roads and pullouts that cause resource damage and create undesirable activities would continue. The Monument would continue operations related to the road such as spot repairs that would be part of routine maintenance for continuing operations.</p>	<p>The proposed action would rehabilitate drainage and pavement conditions on South Rim Drive and the spur roads to and parking areas at White House, Sliding House, Tunnel, Tsegi, Spider Rock, and Junction overlooks. Curbing would be replaced or added as needed, and erosion problems at drainage ditches would be corrected. All routes would be maintained at their current width. Pavement conditions on South Rim Drive and the overlook roads for the most part are good (FHWA 2004). However, the pavement is older than 25 years and is subject to extensive cracking. Canyon de Chelly National Monument has an active road maintenance crew that keeps the cracks sealed (FHWA 2004).</p> <p>The primary purpose of the proposed action is to improve visitor safety and experience, extend the life of roadways by rehabilitating road surfaces, and accommodate oversized vehicles. These improvements would result in better parking, circulation, and travel within the Monument. The action is needed because road surfaces within Canyon de Chelly National Monument are aging and deteriorating and currently there is insufficient capacity for visitor numbers and vehicle sizes.</p> <p>In addition to the roadway rehabilitation work indicated above, guardrails would be added and shoulders improved as necessary along South Rim Drive to address safety concerns. The Navajo Department of Law Enforcement recorded 24 traffic accidents between 1997 and 2003 within the project area including four crashes involving animals, seven crashes involving other vehicles, and one crash with a fixed object. The majority of crashes occurred near the Visitor Center and Thunderbird Lodge (Tyler pers. comm. 2005). Improvements to the circulation patterns and pedestrian crossings would be made to the South Rim Drive / Visitor Center entrance, the South Rim Drive / North Rim Drive intersection, and the South Rim Drive / Thunderbird Lodge Road intersection. Wire fencing will be added to both sides of the roadways to protect livestock, residents, and visitors, as well as to deter the use of social pullouts.</p> <p>The increase in the size and number of oversized vehicles in the Monument has led to inadequate turning radii and parking stalls in numerous areas throughout the Monument. The proposed action would reconfigure and rehabilitate the parking area at the Visitor Center to accommodate oversized vehicles and improve circulation and pedestrian safety, and parking capacity at the White House Overlook would be expanded.</p> <p>The proposed action also includes a number of features and improvements that would be funded by sources other than the Federal Lands Highway Program as follows: the Cottonwood Campground parking/camping areas would be expanded and/or realigned to accommodate oversized vehicles; the Thunderbird Lodge parking area would be rehabilitated; access gates would be installed at overlook parking entrances and at the Visitor Center parking entrance that can be closed after hours to enhance management options for overnight use; and an after-hours visitor information kiosk would be constructed to the west of the Visitor Center parking entrance near the proposed gate.</p> <p>Along the length of South Rim Drive are roads (generally unpaved) that provide access to residential areas along with numerous unauthorized social roads. The unauthorized social roads have adversely impacted the natural and cultural resources of the Monument and in some instances enabled undesirable activities that impact both the community and visitors. Uncontrolled access to the various pullouts after normal visiting hours has also led to undesirable activities at the overlooks. To address these issues, the proposed action would implement measures to facilitate management and use of the unauthorized social roads and pullouts.</p>

ALTERNATIVES

No-Action Alternative	Preferred Alternative
<p><u>Meets project objectives?</u></p> <p>No. Continuing the existing conditions do not improve visitor and resident safety or provide for a good visitor experience due to deteriorating road conditions and facility access, and unsafe shoulders. The insufficient management of unauthorized social roads and turnouts would continue to cause resource damage and encourage undesirable activities.</p>	<p><u>Meets project objectives?</u></p> <p>Yes. The Preferred Alternative meets the Canyon de Chelly National Monument planning objective of providing safe transportation routes along South Rim Drive and the overlook roads, while providing opportunities for visitors to stop and experience the Monument along the route, thus protecting the natural and cultural resources. The Preferred Alternative provides protection for roadside vegetation and soils by reducing the ability to informally leave the road and Monument. The Preferred Alternative improves visitor experience by improving access and/or parking at the White House Overlook, Visitor Center, and Cottonwood Campground. Visitor and resident safety is also enhanced by improving the management of the overlooks and unauthorized social roads.</p>

COMPARATIVE SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS

Potential Environmental Impacts		
Impact Topic	No-action Alternative	Preferred Alternative
Soundscapes	There would be no new impacts to the soundscape. Existing conditions would constitute long-term, minor, and adverse impacts to soundscapes.	Impacts to the soundscape resulting from the Preferred Alternative would primarily come from construction noise. Impacts during construction would be short-term, localized, minor, and adverse. After project completion, impacts would be long-term and negligible.
Visitor Use and Experience	Impacts to visitor use and experience would include deteriorating road conditions, and insufficient capacity and access for oversized vehicles, as well as the continuation of undesirable activities associated with overlooks and unauthorized social roads. Existing conditions would constitute short- and long-term minor to moderate adverse impacts to visitor use and experience.	Impacts resulting from the Preferred Alternative during construction would include road and overlook closures and/or traffic delays. Impacts after project completion would be positive due to roadway, access, and safety improvements. Impacts resulting from the Preferred Alternative during construction would be short-term, minor to moderate, and adverse. Impacts after project completion would be long-term and beneficial.
Archeology	Impacts to archeological resources would remain unchanged. The No-action Alternative is not expected to result in adverse impacts to archeological resources.	Direct impacts during construction would be negligible if construction crews do not extend their activities beyond previously disturbed areas. However, archeological resources could be adversely impacted by activities associated with closure of unauthorized social roads or the placement of fencing along the roadways. With the incorporation of the identified mitigation measures, the Preferred Alternative would result in negligible impacts to archeological resources.
Historic Structures	Impacts to historic structures would remain unchanged. The No-action Alternative is not expected to result in adverse impacts to historic structures.	Direct impacts during construction would be negligible if construction crews do not extend their activities beyond previously disturbed areas. However, historic structures could be adversely impacted by activities associated with the placement of fencing along the roadways. With the incorporation of the identified mitigation measures, the Preferred Alternative would result in negligible impacts to historic structures.

Comparative Summary of Potential Environmental Impacts

Potential Environmental Impacts		
Impact Topic	No-action Alternative	Preferred Alternative
Ethnographic Resources	Impacts to ethnographic resources would remain unchanged. The No-action Alternative is not anticipated to result in adverse impacts to ethnographic resources.	Direct impacts during construction would be negligible if construction crews do not extend their activities beyond previously disturbed areas. Additionally, access to ethnographic resources could be restricted by the closure of certain unauthorized social roads or the placement of fencing along the roadways. With the incorporation of the identified mitigation measures, the Preferred Alternative would result in negligible impacts to ethnographic resources.
Local Community	There would be no new impacts to the local community. Existing conditions would constitute long-term negligible impacts to the local community.	Impacts resulting from the Preferred Alternative during construction would include road closures and/or traffic delays. Impacts after project completion would be positive due to roadway, access, and safety improvements. The closure of certain unauthorized social roads would benefit the local community through resource protection and a reduction in undesirable activities associated with the unauthorized social roads. Fencing incorporated along the roadways would improve resource protection and livestock, resident, and visitor safety. Impacts resulting from the Preferred Alternative during construction would be short-term, minor to moderate, and adverse. Impacts after project completion would be long-term and beneficial.

ALTERNATIVES

AFFECTED ENVIRONMENT

This section provides a summary of the Monument resources potentially affected by the proposed action.

Canyon de Chelly National Monument is located on a high plateau on the Navajo Nation Reservation in northeastern Arizona, near the Four Corners area. The Monument is east of the town of Chinle, on the northwest slope of the Defiance Plateau. Three primary red-walled canyons make up the Monument—Canyon del Muerto, Monument Canyon, and Canyon de Chelly—which encompass 33,930 hectares (83,840 acres) or 339.3 square kilometers (130 square miles). The steep sandstone walls of these canyons have been sculpted by wind and water into a wide variety of dramatic formations. The canyons range in depth from 9 meters (30 feet) deep at the mouth to over 305 meters (1,000 feet) deep just 24 kilometers (15 miles) away. At an elevation of 1,525 to 1,830 meters (5,000 to 6,000 feet), the area is characterized by an arid climate, with temperatures ranging from 40.6 degrees Celsius (105 degrees Fahrenheit) in summer to -34.4 degrees Celsius (-30 degrees Fahrenheit) in winter. The average rainfall is about 24.4 centimeters (9.6 inches) per year.

Situated at the southernmost boundary of the Great Basin Desert, it is generally included as part of the Upper Sonoran habitat zone. The Monument's vegetation varies from the canyon rims to the canyon floors as well as varying with a rise in elevation of over 460 meters (1,500 feet) from the lower canyons to the upper canyons. The vegetation changes from desert grasslands in the Chinle Wash area to stands of piñon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) on the canyon rims and on the uplands of the canyons.

Canyon de Chelly National Monument was established in 1931 to preserve a significant collection of prehistoric and historic cultural/archeological resources representing nearly 4,000 years of occupations by ancestral Puebloan Indians as well as historic and modern-day Navajo peoples. The floors of the canyons within the Monument (e.g., Canyon de Chelly, Canyon del Muerto) remain the homes, farms, and traditional grazing lands for approximately 50 Navajo families. The 1931 legislation establishing the Monument assigned primary responsibility for the management of cultural resources, park administration, and visitor services to the NPS.

SOUNDSCAPES

The NPS defines a natural soundscape as "... an area characterized by certain ambient acoustical and sound level qualities, absent the intrusion of sounds caused by humans or human technology. The natural soundscape is a component of any park setting that is intended to be managed or appreciated as natural, such as wilderness areas. The natural soundscape is viewed as a resource, as having value for its presence, and as a value to be appreciated by visitors ..." (NPS 2005b). Natural sounds occur within and beyond the range of sounds that humans can perceive and can be transmitted through air, water, or solid materials. In a park setting, a natural soundscape could include such noises as birds, wind, running water, insects, etc. The characteristics of soundscapes depend on location, season, and time of day.

The NPS is mandated by Director's Order 47 to communicate NPS operational policies that will require, to the fullest extent feasible, the protection, maintenance, or restoration of the natural soundscape resource in a condition unimpaired by inappropriate or excessive noise sources. Natural sounds are intrinsic elements of the environment that are often associated with parks and park purposes. They are inherent components of "the scenery and the natural and historic objects and the wildlife" protected by the NPS Organic Act. Natural sounds are vital to the natural functioning of many parks and may provide indicators of the health of various ecosystems. Intrusive sounds are of concern to the NPS, because they sometimes impede the Service's ability to accomplish its mission.

The natural soundscape at Canyon de Chelly National Monument is only mildly compromised by the ongoing activities of Monument visitors and guided tours operated by Monument concessionaires (primarily vehicle related noise). At Canyon de Chelly National Monument, noise levels associated with human activities are primarily due to traffic on the Monument roadways, parking areas, campgrounds, and other facilities. Human caused noise levels are greatest in the areas of greatest activity, primarily in the vicinity of the Visitor Center, Thunderbird Lodge, and overlook parking areas. There are currently no noise generating warning devices such as rumble strips in the roadways. Within the canyon system, the natural soundscape predominates with occasional sounds related to guided tour groups and residential activities.

Some of the other noises in the present soundscape include bird and amphibian calls and aircraft noise associated with the air tourism industry. However, air tourism over the Monument is somewhat restricted with only 185 flights authorized per year (70 FR 58778). Generally, even in the vicinity of the overlooks except for extremely busy days, the sound environment of the Monument may be characterized as quiet.

VISITOR USE AND EXPERIENCE

Most of the park's recreational visits are day use. Total annual recreational visitation has slowly increased from approximately 819,000 visits in 1996 to 936,000 visits in 2004. Overnight visitation has declined from 101,000 visits in 1996 to 64,000 visits in 2004 (NPS 2005c). Approximately 33 percent of annual recreational visits occur during the summer months of June, July, and August. Approximately 29 percent of annual recreational visits occur during the spring (March, April, and May), 22 percent occur in the fall (September through November), and 16 percent in the winter (December through February). Visitor services and activities include a Visitor Center, camping, lodging, hiking, jeep and horseback trails and tours, rock art viewing, picnicking, and photography.

South Rim Drive is one of two main roads providing access to and viewing of the Monument (see Figure 1). There are pullouts for viewing scenic areas, some of which are handicap accessible. The deteriorating surface of South Rim Drive and the overlook roads may lead to a reduced visitor experience. There are also some safety concerns due to a lack of shoulders and/or guard rails (clear zones) along South Rim Drive. Other safety concerns for both visitors and residents include undesirable activities that occasionally occur in areas accessed by unauthorized social roads and at the overlooks, and potentially unsafe vehicle and pedestrian conditions at the intersections in the vicinity of the Visitor Center.

Inadequate roadway geometries in the Cottonwood Campground and at the Visitor Center, as well as inadequate parking at the White House Overlook, may lead to increased visitor frustration, particularly to drivers of oversized vehicles. Local residents frequently move their livestock from grazing area to grazing area crossing the road as well as allowing for open grazing. Under the open grazing policy there are livestock fatalities and vehicle damage to residents and visitors.

ARCHEOLOGY

While the Monument is most renowned for its Puebloan ruins, the archeological record actually goes back perhaps 4,000 to 5,000 years. Some 1,485 archeological sites have been recorded in the Monument, but it is thought that perhaps 3,000 to 4,000 sites actually exist in the Monument. An estimated 1,500 to 2,000 rock art panels exist within the Monument with as many as 30,000+ individual elements.

While there are dozens of highly visible Anasazi cliff dwellings in the main canyons and perhaps hundreds of archeological sites, much of the Monument has yet to be subject to systematic archeological survey. Until recently that had been the case for the South Rim Drive and overlook spur road corridors. South Rim Drive was first constructed prior to the environmental mandates of the 1970s, and the area was not surveyed for heritage resources during that construction process.

As part of this current planning effort, certain previously unsurveyed portions of South Rim Drive were designated for survey by NPS staff in the spring of 2006. A heritage resources survey of these portions of South Rim Drive was completed in June. The survey resulted in the documentation of 18 heritage resources. These included one Archaic Period archeological site, three prehistoric Puebloan archeological sites, one multicomponent archeological site (Puebloan and Navajo), two historic Navajo archeological sites, and one historic Anglo site. In addition, there were three Puebloan archeological isolated occurrences, three isolated occurrences of indeterminate age and cultural affiliation, and one historic Navajo isolated occurrence. There were also three ethnographic isolated objects (EIOs) that are all recent Navajo. Seven sites were provisionally recommended as eligible to the National Register of Historic Places, all under Criterion D. These include Site 013, the Whitehouse Road Kiva; RECON- 2, a stone hogan; RECON- 3, a Puebloan artifact scatter; RECON- 4, a four- post-type hogan; RECON- 5, a posited Archaic Period lithic scatter with two hearths; RECON- 6, a log cabin-type hogan; and RECON- 7, a posited segment of the old Fort Defiance-Chinle Road.

HISTORIC STRUCTURES

Canyon de Chelly National Monument is a well- known destination for tourists who come to see its dramatic sandstone cliffs, cliff dwellings, and traditional Navajo hogans. There are 164 documented prehistoric/historic structures with estimates in the range of 400 additional structures not yet recorded. The cliff dwellings and other Puebloan structures, discussed previously, are all in the canyons. One also finds Navajo rancherias in the canyons. The most distinctive structures at traditional Navajo rancherias are hogans.

More recent structures and other resource elements are layered on top of older resources. An example of this at Canyon de Chelly was the 19th and 20th century Navajo modification and reuse of Puebloan rooms for stock pens and grain storage. There are a number of Navajo rancherias in the vicinity of South Rim Drive and the spur roads and overlooks, most of which are south of South Rim Drive, between it and Little White Horse Canyon. Most rancherias along South Rim Drive are set back a considerable distance from the road and none appear to be in the area of potential effect (APE).

Certain unsurveyed portions of South Rim Drive were surveyed for heritage resources in June of 2006. The survey documented three standing Navajo hogans. These are RECON- 2, a stone hogan; RECON- 4, a four- post-type hogan; and RECON- 5, a log cabin-type hogan. They were all provisionally recommended as eligible to the National Register. No other historic structures exist in the APE.

ETHNOGRAPHIC RESOURCES

Ethnographic resources consist of parts of the natural and built environments that have traditional cultural significance. Ethnographic resources might include such things as dramatic rock formations, waterfalls, springs, mountains, viewsheds, traditional use areas, spiritually significant areas, ceremonial grounds, archeological sites and features, and historic structures.

In the park, ethnographic resources include areas visited by Navajo deities, places which figure in legends, areas where traditional ceremonies take place, traditional agricultural areas, locations where natural herbs or other medicinal materials are collected, and domestic areas that have been continually inhabited for several generations. There are also Puebloan places in the Monument that still figure in the Hopi cultural landscape. Ethnographic resources can be thought of as layered; that is, the resource itself is a record of prehistoric and historic change and each time period has its significant components and features.

An example of a spiritually significant ethnographic resource is Spider Rock. This sandstone chimney rock is the home of Spider Woman, a deity prominent in the Navajo creation account and present when the Navajo people emerged into this world (the fifth world). Her home at Spider Rock is among the most spiritually important places in the Navajo world. South Rim Drive ends at Spider Rock Overlook Road. Another area of particular cultural and ethnographic importance is the White House Overlook and Trailhead. A long established Navajo trail called "Woman's Trail" is essentially followed by the current trail from the White House parking area to White House Ruin. Consequently, the Navajo may have concerns about proposed modifications to this area.

For the Historic Period, eight distinct Navajo cultural resources have been identified with upwards of 150 individual elements including rancherias, fields, orchards, roads, trails, irrigation systems, and so on. There may be literally hundreds of places with ethnographic significance within the Monument boundaries. However, while it is clear that the ethnographic resources of Canyon de Chelly National Monument are rich and multilayered, a systematic ethnographic resource study has not yet been conducted.

The June 2006 heritage resources survey mentioned above documented three ethnographic isolated objects along South Rim Drive. These were RECON EIO- 1, a contemporary Navajo

descanse (an informal roadside funerary monument); RECON EIO- 2, a contemporary Navajo wishing pile; and RECON EIO- 3, another descanse. None of these were found to meet criteria for National Register eligibility.

Other ethnographic resources, such as plants used for traditional purposes, may be reached by using unauthorized social roads. At this point, it would appear that the main areas of concern with regard to the present proposed project are the White House Overlook area, the Spider Rock Overlook area, and certain unauthorized social roads used to reach ethnographic resources. Some traditional Navajo use these areas for spiritual purposes.

LOCAL COMMUNITY

Canyon de Chelly National Monument is unique among NPS units because it comprises Navajo Tribal Trust Lands that remain home to the Navajo canyon community. Navajo families still inhabit the floors of the canyons, and crops continue to be cultivated. Navajo also keep sheep and goats within the canyon system. Numerous homes are located on the rims within and adjacent to the Monument boundaries.

As mentioned previously, there are approximately 300 roads that fall into the criteria of unpaved two- tracks without a determined and useful destination on the South Rim of Canyon de Chelly National Monument (“unauthorized social road”). Although considered unauthorized by the Monument, some of these roads are utilized by the local community for ceremonies, plant gathering, and other traditional activities. However, the use of some of these roads has also led to undesirable activities and resource damage. Local residents frequently move their livestock from grazing area to grazing area crossing the road as well as allowing for open grazing. Under the open grazing policy there are livestock fatalities and vehicle damage to residents and visitors.

The Monument is a source of tourism dollars and jobs to the local economy including Navajo concessionaires and tour guides. Travelers are only allowed into the canyons if accompanied by a Monument ranger or authorized Navajo guide. Tourists visiting the Monument can stay at the Cottonwood or Spider Rock Campgrounds (the latter a private campground), at the Thunderbird Lodge, or in the nearby town of Chinle. Concession jeep and horseback tours are available from the Thunderbird Lodge and other guide services. When the Monument was established, it gave the Navajo exclusive rights to rent horses to tourists.

The community of Chinle, near the Navajo Indian Reservation’s geographic center, is located adjacent to the western Monument boundary. The tribal government has designated Chinle one of the major “growth centers” on the reservation. It is an important trade, administrative, and educational center within the Chinle Chapter (a local government unit) and is headquarters for the Chinle Agency, one of the reservations five Bureau of Indian Affairs administrative jurisdictions (Arizona Department of Commerce 2001). Facilities in Chinle include a Tribal Chapter House, Tseyi Shopping Center, a rifle range, a community center with gym, schools, medical facilities, the fire department, a senior citizens center, various churches, a park, athletic facilities, rodeo arena, and riding stables. Chinle is also the major shopping center in the region with numerous grocery stores, restaurants, gas stations, and other facilities available. South Rim Road provides the primary means of access between the residents living in and around the South Rim area of the Monument and the community of Chinle.

ENVIRONMENTAL CONSEQUENCES

This section describes the environmental consequences associated with the No- action and Preferred Alternatives. The impact topics are organized to focus on the important environmental issues and concerns resulting from the alternatives into distinct topics for discussion and analysis. NPS's NEPA analysis requires a discussion of impacts, their context intensity and duration, and possible cumulative effects. NPS also requires an assessment of whether or not the alternatives would "impair" park unit resources. The No- action Alternative is discussed first and provides the basis for comparing the potential impacts associated with the Preferred Alternative.

METHODOLOGY

Overall, NPS based the analysis, discussion, and conclusions of the potential environmental impacts associated with the alternatives on the review of existing literature, Canyon de Chelly National Monument studies, information provided by Monument staff and other experts and agencies, and professional judgments; interested local Native American tribes; and public input. NPS Director's Order 12 states that the impact analysis must include considerations for context, intensity, and duration (NPS 2005d; Section 2.9).

The following definitions of context, intensity, duration, timing, and impact type were used in the evaluation of potential impacts associated with the project alternatives:

Context

Context is the setting within which an impact is analyzed such as local, parkwide, or regional. The Council on Environmental Quality requires that the analysis of impacts include considerations of context. For this action, local impacts would occur in the immediate vicinity of the South Rim Drive and spur road corridors, the overlooks, the Visitor Center, Thunderbird Lodge, and the Cottonwood Campground. Parkwide impacts would affect a greater area of the Monument than the local impacts, while regional impacts would affect areas beyond the Monument boundaries.

Intensity

Impact intensity is the degree with which a resource would be beneficially or adversely affected. The criteria that were used to rate the intensity of the impacts for each resource impact topic are presented below under each resource topic heading.

Duration

The duration of impacts associated with the alternatives is defined as "short- term" or "long- term." Short- term impacts are temporary and generally only occur during project construction, although some temporary, short- term impacts may persist for a definite period of time beyond project construction (e.g., a year). Long- term impacts generally occur or continue to occur well beyond the period of construction. The duration for each resource impact topic used in this analysis is discussed below under each resource heading.

Impact Type

Impacts can be beneficial or adverse. Beneficial impacts would improve the condition of resources, while adverse impacts would deplete, degrade, or otherwise negatively alter resources.

In addition to the criteria listed above, impacts are also characterized as being “direct,” “indirect,” or “cumulative.” Direct and indirect impacts are analyzed but are not identified in the narrative. The following definitions of direct, indirect, and cumulative impacts are considered in this analysis:

Direct effect

Impacts are caused by the alternative and occur at the same time and in the same place as the action.

Indirect effect

Impacts are caused by the action but occur farther away or later in time from the action.

Cumulative effect

Impacts to a particular resource are additive resulting from the combination of the alternative along with actions from the past, present, and foreseeable future actions.

CUMULATIVE EFFECTS

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

Cumulative impacts are considered for each alternative and are presented at the end of each impact topic discussion analysis.

Projects That Make Up the Cumulative Impact Scenario

To determine potential cumulative impacts, projects in and around Canyon de Chelly National Monument were identified. The area included Canyon de Chelly National Monument and nearby lands administered by federal, state, local, and private entities. Projects were determined through consultation with Monument staff. Potential projects identified as cumulative actions included any planning or development activity that was currently being implemented or that would be implemented in the reasonably foreseeable future.

These cumulative actions are evaluated in the cumulative impact analysis in conjunction with the impacts of each alternative to determine if they would have any additive effects on the impact topics chosen for consideration in this environmental assessment / assessment of effect. Because some of these cumulative actions are in the early planning stages, the evaluation of cumulative effects was based on a general description of the proposed project or action.

Past Actions

The following past actions could contribute to cumulative effects:

As indicated in the Introduction of this document, this project is a continuation of a previous pavement improvement project implemented in fiscal year 2002. That project initially intended to rehabilitate the roads on the South Rim, but was shifted to the North Rim and South Rim spur roads to accommodate the possibility of the installation by Indian Health Services of a waterline that would cross South Rim Drive many times. These roads were in poor condition.

Current and Future Actions

Current actions and those projected for the future could also contribute to cumulative effects. These include:

the Fort Defiance District of the Navajo Area Indian Health Service proposal to construct new water and wastewater service to approximately 115 homes in the Chinle Chapter, Apache County, Arizona. Major facilities to be installed include: approximately 22.5 kilometers (14 miles) of 15.2, 10.2, and 5.1 centimeter (6, 4, and 2-inch) waterline, 115 individual septic tank waste treatment systems, 2 storage tanks, and two booster pumping stations. Because the pipeline project lies within the same corridor as the proposed roadway rehabilitation project considered in this EA, the threatened and endangered species conservation measures described in the Introduction section of this EA under Threatened and Endangered Species / Species of Special Concern will also be applied to the pipeline project.

the EA and FONSI for a cooperative watershed restoration and management program have been completed, and the project is currently being implemented for Canyon de Chelly National Monument

development of a Comprehensive Interpretive Plan

addressing of vehicle impacts and restoration efforts at Canyon de Chelly National Monument

individual/concessionaire alterations to stream channels and/or stream channel crossing in riparian corridors at Canyon de Chelly National Monument

external up- canyon dam impoundments. The consequences of Tsailie and Wheatfields Dams on the canyons of Canyon de Chelly National Monument have not been studied. The reduction of peak flows and loss of sediment replacement, which would have naturally occurred in the absence of these dams, undoubtedly has and will continue to affect the canyon riparian corridors

new employee housing is proposed in the employee housing area of Canyon de Chelly National Monument (south of the Thunderbird Lodge). The housing would replace two old trailers and would result in a potential increase of two to four employee dwelling units

rehabilitation work is proposed for the White House Trail at Canyon de Chelly National Monument

new bathrooms are proposed at White House Ruin at Canyon de Chelly National Monument (in the inner canyon)

“incidental” development and other activities by members of the Navajo community living both inside and outside of the Monument boundaries

numerous ongoing vegetation, soil, wildlife, archeology, and other natural and cultural resource surveys at Canyon de Chelly National Monument.

IMPAIRMENT OF CANYON DE CHELLY NATIONAL MONUMENT RESOURCES OR VALUES

In addition to determining the environmental consequences of the preferred and other alternatives, the NPS *Management Policies 2001* and *Director’s Order – 12* require analysis of potential effects to determine if actions would impair Canyon de Chelly National Monument resources.

The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. NPS managers must always seek ways to avoid or minimize, to the greatest degree practicable, adverse impacts on park and monument resources and values. However, the laws do give NPS management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park or monument, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given NPS management discretion to allow certain impacts within parks and monuments, that discretion is limited by statutory requirement that the NPS must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park or monument resources or values, including opportunities that otherwise would be present for the enjoyment of those resources or values. An impact to any park or monument resource or value may constitute impairment. However, an impact would more likely constitute impairment to the extent that it affects a resource or value whose conservation is:

necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park or monument

key to the natural or cultural integrity of the park or monument or to opportunities for enjoyment of the park or monument

identified as a goal in the Monument’s procedures or other relevant NPS planning and management documents

Impairment may result from NPS activities in managing the park or monument, visitor activities, or activities undertaken by concessionaires, contractors, and others operating in the park or monument. In this “Environmental Consequences” section, a determination on impairment is made in the conclusion statement of the appropriate impact topics for each alternative. The NPS does not analyze visitor use and experience (unless impacts are resource-based) or local community for impairment.

IMPACTS TO CULTURAL RESOURCES AND SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT

This environmental assessment / assessment of effect is written in accordance with Section 106 of the National Historic Preservation Act as amended, and the conclusions for the level of impact are identified in the respective cultural resource sections of this document (i.e., archeology, historic structures, and ethnographic resources). In this environmental assessment / assessment of effect, impacts to cultural resources 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 that implement NEPA. These impact analyses are intended, however, to comply with the requirements of both NEPA 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 800, Protection of Historic Properties), impacts to archeological and cultural resources were identified and evaluated by (1) determining the area of potential effects (APE); (2) identifying cultural resources present in the area of potential effects that were either listed in or eligible to be listed in the National Register of Historic Places; (3) applying the criteria of adverse effect to affected cultural resources, either listed in or eligible to be listed in the National Register of Historic Places; and (4) 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 National Register of Historic Places eligible 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 of Historic Places, e.g., 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 Preferred Alternative that would occur later in time, be farther removed in distance, or be cumulative (36 CFR 800.5, Assessment of Adverse Effects). A determination of no adverse effect means there may be 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 and the NPS *Director's Order – 12* also call for a discussion of the appropriateness of mitigation, as well as an analysis of how effective the mitigation would be in reducing the intensity of a potential impact, e.g., reducing the intensity of an impact from major to moderate or minor. Any resultant reduction in intensity of impact due to mitigation, however, is an estimate of the effectiveness of mitigation under NEPA only. 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 sections for cultural resources under the Preferred Alternative. The Section 106 summary is intended to meet the requirements of Section 106, and is an assessment of the effect of the undertaking (implementation of the alternative) on cultural resources, based on the criterion of adverse effect found in the Advisory Council's regulations.

ENVIRONMENTAL CONSEQUENCES – ALTERNATIVE 1: NO-ACTION**Soundscapes**

Impact Intensity	Intensity Definition
Negligible	In the Developed Zone, human-caused noise may be present much of the time during daylight hours. When noise is present, it is mostly at low levels that do not interfere with normal activities. In the Natural/Cultural Zone, natural sounds predominate. When human noise is present, it is at very low levels, occurs only for short durations in most of the area, and generally would not be noticed. Visitors almost always have the opportunity to experience the natural soundscape free from human-caused noise.
Minor	In the Developed Zone, human-caused noise may predominate during daylight hours, but for the majority of the time the noise is at low levels, and is only rarely at greater than medium levels. Most visitors would not notice the noise. In the Natural/Cultural Zones, natural sounds usually predominate. Human-caused noise is present only infrequently, and occurs only at low levels and for short durations in most of the area. Visitors have the opportunity to experience the natural soundscape free from human-caused noise most of the time in most of the area.
Moderate	In the Developed Zone, human-caused noise predominates during daylight hours, but it is at medium or lower levels a majority of the time. Nevertheless, noise levels would be readily perceptible and may adversely impact the visitor experience for some people. In the Natural/Cultural Zone, human-caused noise is present infrequently to occasionally, at low to medium levels and durations. Visitors generally would be aware of the effect of the noise on the natural environment, and may express negative opinions.
Major	In the Developed Zone, human-caused noise predominates during daylight hours, and is at greater than medium levels a majority of the time that noise is present. Large areas may experience human-caused noise at medium to high levels during a majority of the daylight hours. A majority of visitors would be negatively impacted by the noise levels. In the Natural/Cultural Zone, natural sounds commonly are masked by human-caused noise at low or greater levels for extended periods of time, thus negatively impacting the visitor experience.

It is a goal of the National Park Service to preserve and restore a park's natural soundscape in the absence of human- caused sound (NPS 2000; Section 4.9).

In assessing soundscapes, Monument lands were divided into two categories: the Developed Zone and the Natural/Cultural Zone. The Developed Zone represents the areas of relatively high developed density in and around the Visitor Center and includes the Cottonwood Campground and Thunderbird Lodge. The Natural/Cultural Zone represents the areas within the Monument outside the Developed Zone (i.e., the canyon and rim areas including the overlooks). In the Developed Zone, impacts were assessed based on the ability of a visitor to enjoy the Monument facilities and activities in the area without being unduly impaired by loud, human- made noises. In the Natural/Cultural Zone, impacts were assessed based on the ability of the visitor or canyon resident to experience the natural sounds of the canyon areas, such as wind, water, weather, and wildlife. The intensity of soundscape impacts was assessed using the criteria indicated above.

Impacts to soundscapes are considered to be short- term if the impact duration is no longer than the construction period and long- term if the impact duration is longer than the construction period.

No action would be taken in this alternative; therefore, there would be no new impacts to the soundscapes within the Monument. Under the No- action Alternative, visitors and residents

would continue to experience the natural soundscape along with human- made sound from the developed areas, roadways, activities in the Cottonwood Campground, canyon tours, Navajo social activities, and aircraft noise. Within the canyon, human- made sound is not at a level that would compromise the natural soundscape.

Overall impacts to the natural soundscape from the No- action Alternative would be long-term, minor, and adverse.

Cumulative Impacts. Past, present, and reasonably foreseeable future construction, development, and resource management projects within the Monument and the surrounding region would contribute to temporary increases in noise primarily during construction. Past, present, and reasonably foreseeable future projects with the potential to generate construction noise are listed above. Once construction is completed noise levels in the vicinity of the construction project are expected to return to existing levels as none of the currently foreseeable projects is anticipated to result in a substantial increase in activity or noise levels. The cumulative effects of these actions are short- term, minor, and adverse, and long- term and negligible since the activities would affect limited locations and a limited portion of the Monument as a whole. The No- action Alternative would contribute short- and long- term, minor, adverse impacts to soundscapes. The overall cumulative impacts from past, present, and reasonably foreseeable future impacts, in combination with the No- action Alternative, would be short- and long- term, minor, and adverse.

Conclusion. The existing, No- action Alternative conditions constitute long- term minor adverse impacts to soundscapes resulting from existing human activities. The overall cumulative impacts from past, present, and reasonably foreseeable future impacts, in combination with the No- action Alternative, would be short- and long- term, minor, and adverse.

Impairment of Park Resources and Values. Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the Monument’s establishing legislation, (2) key to the natural or cultural integrity of the Monument or to opportunities for enjoyment of the Monument, or (3) identified as a goal in the Monument’s procedures or other relevant National Park Service planning documents, there would be no impairment of soundscapes.

Visitor Use and Experience

Impact Intensity	Intensity Definition
Negligible	The visitor 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.
Minor	Changes in visitor use and/or experience would be detectable, although the changes would be slight. Some of the visitors would be aware of the effects associated with the alternative, but the effects would not be noticeable by most visitors.
Moderate	Changes in visitor use and/or experience would be readily apparent to most of the visitors. Visitors would be aware of the effects associated with the alternative and might express an opinion about the changes.
Major	Changes in visitor use and/or experience would be readily apparent to all visitors, severely adverse or exceptionally beneficial. Visitors would be aware of the effects associated with the alternative and would likely express a strong opinion about the changes.

Section 8.2 of the NPS Management Policies 2001 states that the enjoyment of park resources and values by the people of the United States is a fundamental purpose of all parks (NPS 2000). It further states that the NPS is committed to providing appropriate, high- quality opportunities for visitors to enjoy the parks in a manner that is open, inviting, and accessible to every segment of American society.

Part of the purpose of Canyon de Chelly National Monument is to offer opportunities for recreation, education, inspiration, and enjoyment. Consequently, a management goal of the Monument is to ensure that visitors safely enjoy and are satisfied with the availability, accessibility, diversity, and quality of park facilities, services, and appropriate recreational opportunities.

Impacts were assessed based on the ability of the visitor to experience the full range of Monument activities, views, and services and compared to the resources and objectives presented in the Monument significance statement. The potential for change in visitor use and experience proposed by the alternatives was evaluated by identifying projected increases or decreases in the use of the South Rim Road, lookouts, and other visitor uses and determining how these projected changes would affect the desired visitor experience and to what degree and for how long. The intensity of visitor use and experience impacts was assessed using the criteria indicated above.

Impacts to visitor use and experience are considered to be short- term if the impact duration is no longer than the construction period and long- term if the impact duration is longer than the construction period.

Visitors that travel South Rim Drive and the overlook roads experience deteriorating road conditions, lack of shoulders, and lack of adequate parking at some locations. Because of these conditions, visitors must pay close attention to the roadway rather than enjoying the beauty of the scenic drive. Visitors driving large vehicles such as recreational vehicles can access the Visitor Center and Cottonwood Campground; however, inadequate turning radii have caused some drivers to drive off the edge of the pavement, thus damaging resources. Insufficient parking at the White House Overlook as well as undesirable activities associated with the overlooks and unauthorized social roads have led to negative visitor experiences. Unsafe conditions at the intersections in the vicinity of the Visitor Center, particularly for pedestrians, have also led to negative experiences. Under the open grazing policy livestock frequently cross the road resulting in livestock fatalities and vehicle damage to residents and visitors.

Under the No- action Alternative, cracking of the deteriorated road surface would be remedied by ongoing patching, while other road, parking, intersection, and livestock conditions would continue. Given the remote location of the Monument, these adverse effects are not anticipated to affect visitation. The existing condition would constitute a short- and long- term, minor to moderate, adverse impact to visitor experience within Canyon de Chelly National Monument.

Cumulative Impacts. Of the past, present, and reasonably foreseeable future projects listed above, only the water/wastewater pipeline construction, the new employee housing

construction, the White House Trail rehabilitation work, and the new bathrooms proposed at White House Ruin are expected to directly impact visitor experience. The short- term effects to visitor use and experience would be related to construction noise, the presence of construction equipment, and construction- related traffic delays or facility closures. Since the cumulative projects are spread throughout the Monument area and would not occur at the same time, these impacts would be noticeable only to some visitors. These activities would have short- term minor adverse impacts on visitor experience for the duration of construction activities.

In the long term, the pipeline construction and employee housing projects are not anticipated to affect visitor experience. The rehabilitation of White House Trail and the new bathrooms at White House Ruin would represent a beneficial impact on visitor experience. The already completed rehabilitation of the North Rim Drive and South Rim Drive spur roads also represents a beneficial impact to visitor experience through the improvements to the roadway surface. The other cumulative projects listed above would result in long- term indirect beneficial impacts to visitor experience as their purpose is to improve and enhance the Monument resources. These long- term improvements would be apparent to some visitors. The improvements would have long- term beneficial effects on visitor experience.

The No- action Alternative would provide minor to moderate adverse contributions to cumulative effects in the short and long term. The overall cumulative effects of these past, present, and reasonably foreseeable future actions, in conjunction with the No- action Alternative, would have short- term minor to moderate adverse impacts on visitor experience and long- term beneficial impacts.

Conclusion. The existing condition would constitute a short- and long- term minor to moderate adverse impact to visitor experience. The overall cumulative effects of past, present, and reasonably foreseeable future actions, in conjunction with the No- action Alternative, would have short- term minor to moderate adverse impacts on visitor experience and long- term beneficial impacts.

Archeology

Impact Intensity	Impact Type	Intensity Description
Negligible	Adverse or Beneficial	Impact is at the lowest levels of detection with neither adverse or beneficial consequences. The determination of effect for Section 106 would be <i>no adverse effect</i> .
Minor	Adverse	Disturbance of a site(s) results in little, if any, loss of integrity. The determination of effect for Section 106 would be <i>no adverse effect</i> .
	Beneficial	Maintenance and preservation of a site(s). The determination of effect for Section 106 would be <i>no adverse effect</i> .
Moderate	Adverse	Disturbance of a site(s) results in loss of integrity. The determination of effect for Section 106 would be <i>adverse effect</i> . A memorandum of agreement is executed among the National Park Service and applicable state or tribal historic preservation officer and, if necessary, the Advisory Council on Historic Preservation in accordance with 36 CFR 800.6(b).
	Beneficial	Stabilization of a site(s). The determination of effect for Section 106 would be <i>no adverse effect</i> .

Impact Intensity	Impact Type	Intensity Description
Major	Adverse	Disturbance of a site(s) results in loss of integrity. The determination of effect for Section 106 would be <i>adverse effect</i> . Measures to minimize or mitigate adverse impacts cannot be agreed upon and the National Park Service and applicable state or tribal historic preservation officer and/or advisory council are unable to negotiate and execute a memorandum of agreement in accordance with 36 CFR 800.6(b).
	Beneficial	Active intervention to preserve a site(s). The determination of effect for Section 106 would be <i>no adverse effect</i> .

This environmental assessment / assessment of effect was written in accordance with Section 106 of the National Historic Preservation Act as amended. Certain previously unsurveyed portions of the South Rim Drive were designated for survey by NPS staff in the spring of 2006. Heritage resources survey of these portions of South Rim Drive was completed in June 2006 as described in Chapter 3. The survey resulted in the documentation of 18 heritage resources. Seven of these sites were provisionally recommended as eligible to the National Register of Historic Places, all under Criterion D (research potential). If a proposed action would diminish the site's integrity, in this case research potential, it is considered to be an adverse impact. For the purposes of this document, the level of impacts to archeological resources was established using the criteria indicated above.

Archeological resource impacts are not considered short- or long- term, because archeological resources are nonrenewable. Once the resource is damaged, its integrity is irreversibly diminished.

Because the No- action Alternative would result in the absence of the roadway and facility improvements that would occur under the proposed action, the deterioration of the roadway and facilities would continue and future spot repairs may be needed. If these repairs involved ground modifications in locations where archeological resources exist, this could represent an adverse impact. However, because the locations of the resources are known as a result of surveys, the Monument will continue to manage the resources pursuant to the National Historic Preservation Act. Consequently, the No- action Alternative is not expected to result in adverse impacts to archeological resources.

Cumulative Impacts. Past, present, and reasonably foreseeable future construction, development, and resource management projects within the Monument and the surrounding region could contribute to permanent archeological resource loss. Past, present, and reasonably foreseeable future projects with the potential to affect archeological resources are listed above. Archeological resources impacts are not considered short- or long- term, because once the resource is impacted, the integrity is irreversibly damaged and would not recover. These other future projects would be subject to the Section 106 process. Consequently, it is assumed that impacts would range from negligible to moderately adverse. Moderate adverse impacts would be addressed through development of memorandums of agreement.

The No- action Alternative is not anticipated to result in adverse contributions to cumulative effects. The overall cumulative effects of these past, present, and reasonably foreseeable future actions, in conjunction with the No- action Alternative, would range from negligible to

moderate. Moderate adverse impacts would be addressed through development of memorandums of agreement.

Conclusion. The No- action Alternative is not expected to result in adverse impacts to archeological resources. Overall cumulative impacts to archeological resources would range from negligible to moderate. Moderate adverse impacts would be addressed through development of memorandums of agreement.

Impairment of Park Resources and Values. Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the Monument’s establishing legislation, (2) key to the natural or cultural integrity of the Monument or to opportunities for enjoyment of the Monument, or (3) identified as a goal in the Monument’s procedures or other relevant National Park Service planning documents, there would be no impairment of archeological resources.

Section 106 Summary. The No- action Alternative is not expected to result in adverse impacts to archeological resources. After applying the Advisory Council on Historic Preservation’s criteria of adverse effect (36 CFR 800.5), the National Park Service proposes that implementing the No- Action Alternative would result in a determination of *no adverse effect*.

Historic Structures

Impact Intensity	Impact Type	Intensity Description
Negligible	Adverse or Beneficial	Impact is at the lowest levels of detection with neither adverse or beneficial consequences. The determination of effect for Section 106 would be <i>no adverse effect</i> .
Minor	Adverse	Disturbance of a structure(s) results in little, if any, loss of integrity. The determination of effect for Section 106 would be <i>no adverse effect</i> .
	Beneficial	Maintenance and preservation of a structure(s). The determination of effect for Section 106 would be <i>no adverse effect</i> .
Moderate	Adverse	Disturbance of a structure(s) results in loss of integrity. The determination of effect for Section 106 would be <i>adverse effect</i> . A memorandum of agreement is executed among the National Park Service and applicable state or tribal historic preservation officer and, if necessary, the Advisory Council on Historic Preservation in accordance with 36 CFR 800.6(b).
	Beneficial	Stabilization of a structure(s). The determination of effect for Section 106 would be <i>no adverse effect</i> .
Major	Adverse	Disturbance of a structure(s) results in loss of integrity. The determination of effect for Section 106 would be <i>adverse effect</i> . Measures to minimize or mitigate adverse impacts cannot be agreed upon and the National Park Service and applicable state or tribal historic preservation officer and/or advisory council are unable to negotiate and execute a memorandum of agreement in accordance with 36 CFR 800.6(b).
	Beneficial	Active intervention to preserve a structure(s). The determination of effect for Section 106 would be <i>no adverse effect</i> .

Certain unsurveyed portions of South Rim Drive were surveyed for heritage resources in June of 2006. The survey documented three standing Navajo hogans. They were all provisionally recommended as eligible to the National Register under Criterion D. An impact to a resource occurs if the alternative would alter the characteristics that qualify the resource for inclusion

on the register. For the purposes of this document, the level of impacts to historic structures was established using the criteria indicated above.

Impacts to historic structures are not considered short- or long- term because historic structures are nonrenewable resources. Once a historic structure is damaged, its integrity is irreversibly diminished.

Because the No- action Alternative would result in the absence of the roadway and facility improvements that would occur under the proposed action, the deterioration of the roadway and facilities would continue and future spot repairs may be needed. If these repairs involved ground modifications in locations where historic structures exist, this could represent an adverse impact. However, because the locations of the resources are known as a result of surveys, the Monument will manage the resources pursuant to the National Historic Preservation Act. Consequently, the No- action Alternative is not expected to result in adverse impacts to historic structures.

Cumulative Impacts. Past, present, and reasonably foreseeable future construction, development, and resource management projects within the Monument and the surrounding region could contribute to permanent loss of historic structures. Past, present, and reasonably foreseeable future projects with the potential to affect historic structures are listed above. Impacts to historic structures are not considered short- or long- term because once the resource is impacted the integrity is irreversibly damaged and would not recover. These other future projects would be subject to the Section 106 process. Consequently, it is assumed that impacts would range from negligible to moderately adverse. Moderate adverse impacts would be addressed through development of memorandums of agreement.

The No- action Alternative is not anticipated to result in adverse contributions to cumulative effects. The overall cumulative effects of these past, present, and reasonably foreseeable future actions, in conjunction with the No- action Alternative, would range from negligible to moderate. Moderate adverse impacts would be addressed through development of memorandums of agreement.

Conclusion. The No- action Alternative is not expected to result in adverse impacts to historic structures. Overall cumulative impacts to historic structures would range from negligible to moderate. Moderate adverse impacts would be addressed through development of memorandums of agreement.

Impairment of Park Resources and Values. Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the Monument's establishing legislation, (2) key to the natural or cultural integrity of the Monument or to opportunities for enjoyment of the Monument, or (3) identified as a goal in the Monument's procedures or other relevant National Park Service planning documents, there would be no impairment of historic structures.

Section 106 Summary. The No- action Alternative is not expected to result in adverse impacts to historic structures. After applying the Advisory Council on Historic Preservation's criteria of adverse effect (36 CFR 800.5), the National Park Service proposes that implementing the No- action Alternative would result in a determination of *no adverse effect*.

Ethnographic Resources

Impact Intensity	Impact Type	Intensity Description
Negligible	Adverse or Beneficial	Impact is at the lowest levels of detection with neither adverse or beneficial consequences. The determination of effect for Section 106 would be <i>no adverse effect</i> .
Minor	Adverse	Disturbance of a site(s) results in little, if any, loss of integrity. The determination of effect for Section 106 would be <i>no adverse effect</i> .
	Beneficial	Maintenance and preservation of a site(s). The determination of effect for Section 106 would be <i>no adverse effect</i> .
Moderate	Adverse	Disturbance of a site(s) results in loss of integrity. The determination of effect for Section 106 would be <i>adverse effect</i> . A memorandum of agreement is executed among the National Park Service and applicable state or tribal historic preservation officer and, if necessary, the Advisory Council on Historic Preservation in accordance with 36 CFR 800.6(b).
	Beneficial	Stabilization of a site(s). The determination of effect for Section 106 would be <i>no adverse effect</i> .
Major	Adverse	Disturbance of a site(s) results in loss of integrity. The determination of effect for Section 106 would be <i>adverse effect</i> . Measures to minimize or mitigate adverse impacts cannot be agreed upon and the National Park Service and applicable state or tribal historic preservation officer and/or advisory council are unable to negotiate and execute a memorandum of agreement in accordance with 36 CFR 800.6(b).
	Beneficial	Active intervention to preserve a site(s). The determination of effect for Section 106 would be <i>no adverse effect</i> .

Systematic ethnographic resource surveys have yet to be completed for the APE. The recently completed archeological survey documented three ethnographic isolates, but these were recommended as not eligible for listing on the National Register. Anecdotal evidence suggests that the major ethnographic resources in the study area are White House Overlook and Spider Rock Overlook. Both of these areas are thought to be used by traditional Navajo for spiritual activities. Access to these areas would be maintained during construction. No modifications to the existing road or parking lot footprint are planned for Spider Rock Overlook. However, some minor modifications to the parking lot and road are planned for the White House Overlook area. These modifications will be designed so that access for traditional Navajo activities is assured. Certain unauthorized social roads potentially identified for closure may be used to access plants used for traditional purposes. For the purposes of this document, the level of impacts to ethnographic resources was established using the criteria indicated above.

Ethnographic resources impacts are not usually considered short- or long- term because most ethnographic resources are nonrenewable. Once the resource is damaged, its integrity is often irreversibly diminished. However, some ethnographic resources, such as plants utilized for traditional healing and crafts, are renewable resources and impacts to those ethnographically important plants can be viewed as short- or long- term.

Canyon de Chelly National Monument contains numerous individual ethnographic resources that are all interrelated and tied closely to the landscape and resources of the canyon. However, as indicated in the Affected Environment section of this document, a systematic ethnographic resource study has not been conducted in these areas. Consequently, it is not known, if ethnographic resources are currently being adversely impacted due to the existing conditions in the project areas.

The No- action Alternative would not close unauthorized social roads that may be used to access areas containing plants used for traditional purposes. Therefore, there would be no adverse impact to these ethnographic uses. Anecdotal evidence suggests that the major ethnographic resources in the study area are the White House Overlook and Spider Rock Overlook parking areas. Both of these areas are thought to be used by traditional Navajo for spiritual activities. Because the No- action Alternative would result in the absence of the roadway and facility improvements that would occur under the proposed action, the deterioration of the roadway and facilities would continue and future spot repairs may be needed. These ongoing repairs are unlikely to cause adverse impacts to ethnographic resources as known.

Consequently, the No- action Alternative is not anticipated to result in adverse impacts to ethnographic resources.

Cumulative Impacts. Past, present, and reasonably foreseeable future construction, development, and resource management projects within the Monument and the surrounding region could contribute to permanent loss of ethnographic resources. Past, present, and reasonably foreseeable future projects with the potential to affect ethnographic resources are listed above. These other future projects would be subject to the Section 106 process. Consequently, it is assumed that impacts would range from negligible to moderately adverse. Moderate adverse impacts would be addressed through development of memorandums of agreement.

The No- action Alternative is not anticipated to result in adverse contributions to cumulative effects. The overall cumulative effects of these past, present, and reasonably foreseeable future actions, in conjunction with the No- action Alternative, would range from negligible to moderately adverse. Moderate adverse impacts would be addressed through development of memorandums of agreement.

Conclusion. The No- action Alternative is not anticipated to result in adverse impacts to ethnographic resources. Overall cumulative impacts to ethnographic resources would range from negligible to moderately adverse. Moderate adverse impacts would be addressed through development of memorandums of agreement.

Impairment of Park Resources and Values. Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the Monument's establishing legislation, (2) key to the natural or cultural integrity of the Monument or to opportunities for enjoyment of the Monument, or (3) identified as a goal in the Monument's procedures or other relevant National Park Service planning documents, there would be no impairment of ethnographic resources.

Section 106 Summary. The No- action Alternative is not expected to result in adverse impacts to ethnographic resources. After applying the Advisory Council on Historic Preservation's criteria of adverse effect (36 CFR 800.5), the National Park Service proposes that implementing the No- action Alternative would result in a determination of *no adverse effect*.

Local Community

Impact Intensity	Intensity Definition
Negligible	Members of the local community would not be affected or impacts to the local community would be below or at the level of detection. Members of the local community would not likely be aware of the effects associated with the alternative.
Minor	Impacts to the local community would be detectable, although they would be slight. Some members of the local community would be aware of the effects associated with the alternative, but the effects would not be noticeable by most members of the community.
Moderate	Impacts to the local community would be readily apparent to most of the members of the community. Members of the community would be aware of the effects associated with the alternative and might express an opinion about the changes.
Major	Impacts to the local community would be readily apparent to all members of the community, severely adverse or exceptionally beneficial. Members of the local community would be aware of the effects associated with the alternative and would likely express a strong opinion about the changes.

Impacts to the local community were evaluated based on the alternative's potential to affect the ability of residents to move freely about the community as well as the ability of the community to access areas of the Monument used for traditional activities. The intensity of local community impacts was assessed using the criteria indicated above.

Impacts to the local community are considered to be short- term if the impact duration is no longer than the construction period and long- term if the impact duration is longer than the construction period.

No action would be taken in this alternative; therefore, there would be no new impacts to the local community. Under the No- action Alternative, residents would continue to experience deteriorating road conditions. However, the Monument would continue to patch the roadways as needed. Therefore, the ability of the local residents to travel throughout the Monument and between their homes and Chinle would not be affected. Although visitors to the Monument would also experience deteriorating road conditions, lack of shoulders, and lack of adequate parking and access at some locations, these effects are not anticipated to be adverse enough to affect visitation. Therefore, there would be no effect on local concessionaires or other tourist- based enterprises.

As discussed in the Affected Environment section of this document, local residents currently utilize a number of unpaved, two- track roads within the Monument that the Monument considers unauthorized. Many of these roads are used by local residents to gain access to areas for traditional purposes. However, the presence of these roads has also occasionally led to the occurrence of undesirable activities (including illegal wood cutting, poaching, trespass, dumping, and drug use). Under the open grazing policy livestock frequently cross the road resulting in livestock fatalities and vehicle damage to residents and visitors. The No- action Alternative would not alter these conditions and, therefore, would represent a negligible impact on the local community.

Overall impacts to the local community from the No- action Alternative would be short- and long- term and negligible.

Cumulative Impacts. Of the past, present, and reasonably foreseeable future projects listed above, projects that could potentially impact the local community would be the water/wastewater pipeline construction, the watershed restoration and management program, addressing of vehicle impacts and restoration efforts, and assessment of the alterations of stream channels and crossing by individuals/concessionaires.

The water/wastewater pipeline would result in short- term impacts to the local residents during construction of the pipeline. In the long term, the pipeline would result in beneficial impacts to the local community as it would bring potable water and wastewater service to the local residents.

The remaining projects are intended to protect and better manage Monument resources. As such they could result in impacts to the local community, if the projects were to result in changes to the use of Monument resources by the local community (e.g., restrict vehicle access). Because these projects are all in the planning stages, the effects on the local community are speculative at this time. Therefore, the cumulative effects of these projects on the local community will need to be addressed through the planning process.

The No- action Alternative would provide negligible contributions to cumulative effects in the short and long term.

Conclusion. The No- action Alternative would constitute a short- and long- term negligible impact to the local community.

ENVIRONMENTAL CONSEQUENCES – ALTERNATIVE 2: PREFERRED ALTERNATIVE

Soundscapes

Impact Intensity	Intensity Definition
Negligible	In the Developed Zone, human-caused noise may be present much of the time during daylight hours. When noise is present, it is mostly at low levels that do not interfere with normal activities. In the Natural/Cultural Zone, natural sounds predominate. When human noise is present, it is at very low levels, occurs only for short durations in most of the area, and generally would not be noticed. Visitors almost always have the opportunity to experience the natural soundscape free from human-caused noise.
Minor	In the Developed Zone, human-caused noise may predominate during daylight hours, but for the majority of the time the noise is at low levels, and is only rarely at greater than medium levels. Most visitors would not notice the noise. In the Natural/Cultural Zones, natural sounds usually predominate. Human-caused noise is present only infrequently, and occurs only at low levels and for short durations in most of the area. Visitors have the opportunity to experience the natural soundscape free from human-caused noise most of the time in most of the area.
Moderate	In the Developed Zone, human-caused noise predominates during daylight hours, but it is at medium or lower levels a majority of the time. Nevertheless, noise levels would be readily perceptible and may adversely impact the visitor experience for some people. In the Natural/Cultural Zone, human-caused noise is present infrequently to occasionally, at low to medium levels and durations. Visitors generally would be aware of the effect of the noise on the natural environment, and may express negative opinions.
Major	In the Developed Zone, human-caused noise predominates during daylight hours, and is at greater than medium levels a majority of the time that noise is present. Large areas may experience human-caused noise at medium to high levels during a majority of the daylight hours. A majority of visitors would be negatively impacted by the noise levels. In the Natural/Cultural Zone, natural sounds commonly are masked by human-caused noise at low or greater levels for extended periods of time, thus negatively impacting the visitor experience.

Impacts to soundscapes are considered to be short- term if the impact duration is no longer than the construction period and long- term if the impact duration is longer than the construction period.

In the short term during project construction, noise in the vicinity of the construction activity could impact the natural soundscape. Given the generally quiet environment of the project area and environs, especially away from the developed areas, even relatively low levels of construction noise attenuated by distance may be perceptible to residents and visitors. Overall, noise levels associated with construction activities would be short- term adverse and moderate in the areas immediately adjacent to the construction activities. Away from the construction activities, noise levels would remain at their current levels. Although potentially disruptive, because construction will be limited to the daylight hours and limited to relatively small areas at any given time, during construction overall impacts to the soundscape would be short- term, localized, adverse, and minor.

Once the construction activity is completed, noise levels are expected to return to preconstruction levels except for potential noise associated with the rumble strips near the Visitor Center. As discussed in the Alternatives section of this document, as part of the intersection safety improvements at the South Rim Drive/Visitor Center entrance and South Rim Drive/North Rim Drive intersections, except where there is a raised median, rumble strips would be constructed under the centerline stripe from west of the South Rim Drive/Visitor Center intersection to east of the South Rim Drive/North Rim Drive intersection. By design rumble strips are meant to produce a relatively loud noise when they are driven on that would also be perceptible to users of the areas surrounding where the rumble strips are utilized. The intent of the rumble strips at these locations is to warn drivers approaching the intersections if they begin to drift across the centerline and into on- coming traffic. However, as this is a no passing zone, it is anticipated that vehicles hitting the rumble strips would be an unlikely and infrequent occurrence.

The individuals that would most likely be adversely affected by noise from these rumble strips are users of Cottonwood Campground, adjacent to the Visitor Center. Although the campground is located over 200 meters (650 feet) from where the rumble strips would be located, given the existing low levels of noise in the area, noise from the rumble strips is expected to be noticeable within the campground, particularly at night when sensitivity is highest. However, this is offset by the circumstance that traffic volumes are typically at their lowest during the nighttime hours. As stated, these rumble strips would be located on curves in a no passing zone. Therefore, although noise from these rumble strips could on occasion be perceived as a nuisance to users of the campground during the nighttime hours, because the occurrence of vehicles hitting the rumble strips is anticipated to be unlikely and infrequent, in the long term, impacts to the Monument soundscape would be negligible.

Overall impacts to the natural soundscape from the Preferred Alternative would be short- term localized minor and adverse, and long- term and negligible.

Cumulative Impacts. Past, present, and reasonably foreseeable future construction, development, and resource management projects within the Monument and the surrounding region would contribute to temporary increases in noise primarily during construction. Past, present, and reasonably foreseeable future projects with the potential to generate construction noise are listed above. Once construction is completed noise levels in the vicinity of the construction project are expected to return to existing levels as none of the currently foreseeable projects is anticipated to result in a substantial increase in activity or noise levels. The cumulative effects of these actions are short- term minor and adverse, and long- term and negligible, since the activities would affect limited locations and a limited portion of the Monument as a whole. The Preferred Alternative would contribute short- term localized minor adverse impacts to soundscapes and negligible long- term impacts to soundscapes. The overall cumulative impacts from past, present, and reasonably foreseeable future impacts, in combination with the Preferred Alternative, would be short- term, localized, minor, and adverse, and long- term and negligible.

Conclusion. The Preferred Alternative would result in short- term localized minor adverse impacts to soundscapes resulting from human activities, and negligible long- term impacts. The overall cumulative impacts from past, present, and reasonably foreseeable future impacts, in combination with the Preferred Alternative, would also be short- term, localized, minor, and adverse, and long- term and negligible.

Impairment of Park Resources and Values. Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the Monument's establishing legislation, (2) key to the natural or cultural integrity of the Monument or to opportunities for enjoyment of the Monument, or (3) identified as a goal in the Monument's procedures or other relevant National Park Service planning documents, there would be no impairment of soundscapes.

Visitor Use and Experience

Impact Intensity	Intensity Definition
Negligible	The visitor 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.
Minor	Changes in visitor use and/or experience would be detectable, although the changes would be slight. Some of the visitors would be aware of the effects associated with the alternative, but the effects would not be noticeable by most visitors.
Moderate	Changes in visitor use and/or experience would be readily apparent to most of the visitors. Visitors would be aware of the effects associated with the alternative and might express an opinion about the changes.
Major	Changes in visitor use and/or experience would be readily apparent to all visitors, severely adverse or exceptionally beneficial. Visitors would be aware of the effects associated with the alternative and would likely express a strong opinion about the changes.

During construction, visitors would have a reduced experience due to construction and the related lane closures, diversions, and overlook closures. Some delays would occur, but these delays would be limited to 5 minutes maximum in the vicinity of the Visitor Center, and 15 minutes maximum elsewhere. Reconfiguration and/or rehabilitation of the parking areas could result in diminished parking during construction. However, access to and parking at the

Visitor Center will be maintained with a maximum delay of 5 minutes getting in or out of the Visitor Center parking lot. Sections of the Cottonwood Campground would be closed on a phased schedule during construction activities. Impacts would be minimized by the project's plan to stage the closure of overlooks and areas within Cottonwood Campground, and to limit work in all areas to the off season to the maximum extent possible (September through February). Spur road and overlook parking area closures will be limited to a maximum of one at a time.

As indicated above, visitors would also be exposed to localized construction noise. Given the remote setting of the Monument, the limited construction activities associated with the Preferred Alternative are not anticipated to deter visitors already willing to travel out to the relatively remote Monument (i.e., no adverse affect on visitation). Because the noise and other construction impacts are localized and will affect only a small portion of the Monument at any time, short- term impacts to visitor use and experience would be adverse and minor to moderate in nature.

After completion of the project, visitors would have an improved experience. The repaired road surfaces, safety improvements, and improved signage would improve the driving experience. Increased capacity for parking and oversized vehicles at the Visitor Center, Cottonwood Campground, and White House Overlook would improve visitor access and experience, and the new information kiosk would aid visitors during the hours when the Visitor Center is closed. Improved management of the unauthorized social roads and of the overlooks would decrease undesirable activities associated with those locations, thus improving visitor experience. The addition of livestock fencing along the road corridor will reduce vehicle/livestock accidents thus improving visitor driving experience. Most project changes may only be noticeable to those visitors familiar with the current conditions.

Overall impacts to visitor use and experience from the Preferred Alternative would be short-term, localized, minor to moderate, and adverse during construction and long- term and beneficial after completion of construction.

Cumulative Impacts. Of the past, present, and reasonably foreseeable future projects listed above, only the water/wastewater pipeline construction, the new employee housing construction, the White House Trail rehabilitation work, and the new bathrooms proposed at White House Ruin are expected to directly impact visitor experience. The short- term effects to visitor use and experience would be related to construction noise, the presence of construction equipment, and construction- related traffic delays or facility closures. Since the cumulative projects are spread throughout the Monument area and would not occur at the same time, these impacts would be noticeable only to some visitors. These activities would have short- term minor adverse impacts on visitor experience for the duration of construction activities.

In the long term, the pipeline construction and employee housing projects are not anticipated to affect visitor experience. The rehabilitation of White House Trail and the new bathrooms at White House Ruin would represent a beneficial impact on visitor experience. The already completed rehabilitation of the North Rim Drive and South Rim Drive spur roads also represents a beneficial impact to visitor experience through the improvements to the roadway surface. The other cumulative projects listed above would result in long- term indirect

beneficial impacts to visitor experience, as their purpose is to improve and enhance the Monument resources. These long- term improvements would be apparent to some visitors. The improvements would have long- term beneficial effects on visitor experience.

The Preferred Alternative would result in minor to moderate adverse contributions to cumulative effects in the short term and beneficial impacts in the long term. The overall cumulative effects of these past, present, and reasonably foreseeable future actions in conjunction with the Preferred Alternative would have short- term minor to moderate adverse impacts on visitor experience and long- term beneficial impacts.

Conclusion. Impacts associated with the Preferred Alternative would constitute a short- term, minor to moderate, adverse impact to visitor experience. The overall cumulative effects of past, present, and reasonably foreseeable future actions in conjunction with the Preferred Alternative would have short- term minor to moderate adverse impacts on visitor experience and long- term beneficial impacts.

Archeology

Impact Intensity	Impact Type	Intensity Description
Negligible	Adverse or Beneficial	Impact is at the lowest levels of detection with neither adverse or beneficial consequences. The determination of effect for Section 106 would be <i>no adverse effect</i> .
Minor	Adverse	Disturbance of a site(s) results in little, if any, loss of integrity. The determination of effect for Section 106 would be <i>no adverse effect</i> .
	Beneficial	Maintenance and preservation of a site(s). The determination of effect for Section 106 would be <i>no adverse effect</i> .
Moderate	Adverse	Disturbance of a site(s) results in loss of integrity. The determination of effect for Section 106 would be <i>adverse effect</i> . A memorandum of agreement is executed among the National Park Service and applicable state or tribal historic preservation officer and, if necessary, the Advisory Council on Historic Preservation in accordance with 36 CFR 800.6(b).
	Beneficial	Stabilization of a site(s). The determination of effect for Section 106 would be <i>no adverse effect</i> .
Major	Adverse	Disturbance of a site(s) results in loss of integrity. The determination of effect for Section 106 would be <i>adverse effect</i> . Measures to minimize or mitigate adverse impacts cannot be agreed upon and the National Park Service and applicable state or tribal historic preservation officer and/or advisory council are unable to negotiate and execute a memorandum of agreement in accordance with 36 CFR 800.6(b).
	Beneficial	Active intervention to preserve a site(s). The determination of effect for Section 106 would be <i>no adverse effect</i> .

A heritage resources survey of certain previously unsurveyed portions of South Rim Drive was completed in June 2006. The survey resulted in the documentation of 18 heritage resources. Seven of these sites were provisionally recommended as eligible to the National Register of Historic Places, all under Criterion D.

The proposed construction and repaving activities are essentially confined to the existing road beds, parking lots, and road shoulders. The Preferred Alternative would produce negligible impacts to archeological resources if construction crews do not extend their activities beyond these previously disturbed areas. Archeological monitoring and/or temporary fencing or

flagging will be implemented during construction in the vicinity of archeological sites to assure that activities and equipment do not impact archeological resources.

In addition to repaving the existing roads, parking lots, and some associated paved drains, a minor amount of widening is proposed at the intersection of the North Rim Drive and South Rim Drive. An examination of existing archeological records show that no archeological resources eligible for listing on the National Register exist in this area that might be impacted by the proposed construction activities. The proposed action would result in negligible impacts in this area.

Some social roads may be selected for closure as part of this project and the physical measures used to close these roads have yet to be determined. Eligible archeological resources will be avoided in the road closure process through coordination with an NPS archeologist.

Fencing is also proposed along the length of the roadways. This fence will be placed in previously disturbed areas within the road corridor or in other ways to avoid eligible archeological resources. In the vicinity of eligible archeological sites, the fence location will be determined by an NPS archeologist and road engineer in coordination with other appropriate staff and/or interested parties.

Therefore, the Preferred Alternative would result in negligible impacts to archeological resources. Archeological resources impacts are not considered short- or long- term, because once the resource is impacted, the integrity is irreversibly damaged and would not recover.

Cumulative Impacts. Past, present, and reasonably foreseeable future construction, development, and resource management projects within the Monument and the surrounding region could contribute to permanent archeological resource loss. Past, present, and reasonably foreseeable future projects with the potential to affect archeological resources are listed above. Archeological resources impacts are not considered short- or long- term, because once the resource is impacted, the integrity is irreversibly damaged and would not recover. These other future projects would be subject to the Section 106 process. Consequently, it is assumed that impacts would range from negligible to moderately adverse. Moderate adverse impacts would be addressed through development of memorandums of agreement.

The Preferred Alternative is not anticipated to result in adverse contributions to cumulative effects. The overall cumulative effects of these past, present, and reasonably foreseeable future actions in conjunction with the Preferred Alternative would range from negligible to moderate. Moderate adverse impacts would be addressed through development of memorandums of agreement.

Conclusion. Potential impacts to archeological resources from the Preferred Alternative would be negligible. Overall cumulative impacts to archeological resources would range from negligible to moderate. Moderate adverse impacts would be addressed through development of memorandums of agreement.

Impairment of Park Resources and Values. Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the Monument's establishing legislation, (2) key to the natural or cultural integrity of the Monument or to opportunities for enjoyment of the Monument, or (3) identified as a goal in the Monument's procedures or other relevant National Park Service planning documents, there would be no impairment of park values in terms of archeological resources.

Section 106 Summary. Under the Preferred Alternative, mitigation would be effective in reducing adverse impacts to the negligible level on archeological sites within the area of potential effect. After applying the Advisory Council on Historic Preservation's criteria of adverse effect (36 CFR 800.5), the National Park Service proposes that implementing the Preferred Alternative would result in a determination of *no adverse effect*.

Historic Structures

Impact Intensity	Impact Type	Intensity Description
Negligible	Adverse or Beneficial	Impact is at the lowest levels of detection with neither adverse or beneficial consequences. The determination of effect for Section 106 would be <i>no adverse effect</i> .
Minor	Adverse	Disturbance of a structure(s) results in little, if any, loss of integrity. The determination of effect for Section 106 would be <i>no adverse effect</i> .
	Beneficial	Maintenance and preservation of a structure(s). The determination of effect for Section 106 would be <i>no adverse effect</i> .
Moderate	Adverse	Disturbance of a structure(s) results in loss of integrity. The determination of effect for Section 106 would be <i>adverse effect</i> . A memorandum of agreement is executed among the National Park Service and applicable state or tribal historic preservation officer and, if necessary, the Advisory Council on Historic Preservation in accordance with 36 CFR 800.6(b).
	Beneficial	Stabilization of a structure(s). The determination of effect for Section 106 would be <i>no adverse effect</i> .
Major	Adverse	Disturbance of a structure(s) results in loss of integrity. The determination of effect for Section 106 would be <i>adverse effect</i> . Measures to minimize or mitigate adverse impacts cannot be agreed upon and the National Park Service and applicable state or tribal historic preservation officer and/or advisory council are unable to negotiate and execute a memorandum of agreement in accordance with 36 CFR 800.6(b).
	Beneficial	Active intervention to preserve a structure(s). The determination of effect for Section 106 would be <i>no adverse effect</i> .

Certain unsurveyed portions of South Rim Drive were surveyed for heritage resources in June of 2006, as previously mentioned. The survey documented three standing Navajo hogans. They were all provisionally recommended as eligible to the National Register.

The proposed construction and repaving activities are essentially confined to the existing road beds, parking lots, and road shoulders. The Preferred Alternative would reduce negative impacts to the negligible level for historic structures in the APE if construction crews do not extend their activities beyond these previously disturbed areas. Monitoring or temporary fencing or flagging would be implemented during construction to help prevent impacts to historic structures in the vicinity of the APE and to assure that activities and equipment do not stray out of previously disturbed areas.

Fencing is also proposed along the length of the roadways. This fence will be placed in previously disturbed areas within the road corridor or in other ways to avoid eligible historic structures. In the vicinity of eligible historic structures, the fence location will be determined by an NPS archeologist and road engineer in coordination with other appropriate staff and/or interested parties.

Therefore, the Preferred Alternative would result in negligible impacts to historic structures.

Cumulative Impacts. Past, present, and reasonably foreseeable future construction, development, and resource management projects within the Monument and the surrounding region could contribute to the future loss of historic structures. Past, present, and reasonably foreseeable future projects with the potential to affect historic structures are listed above. The loss of historic structures is not considered short- or long- term because once the resource is impacted the integrity is irreversibly damaged and cannot not recover. Future projects would be subject to the Section 106 process. Consequently, it is assumed that impacts would range from negligible to moderately adverse. Moderate adverse impacts would be addressed through development of memorandums of agreement.

The Preferred Alternative is not anticipated to result in adverse contributions to cumulative effects. The overall cumulative effects of these past, present, and reasonably foreseeable future actions in conjunction with the Preferred Alternative would range from negligible to moderate. Moderate adverse impacts would be addressed through development of memorandums of agreement.

Conclusion. Potential impacts to historic structures from the Preferred Alternative would be negligible. Overall cumulative impacts to historic structures would range from negligible to moderate. Moderate adverse impacts would be addressed through development of memorandums of agreement.

Impairment of Park Resources and Values. Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the Monument's establishing legislation, (2) key to the natural or cultural integrity of the Monument or to opportunities for enjoyment of the Monument, or (3) identified as a goal in the Monument's procedures or other relevant National Park Service planning documents, there would be no impairment of park values in terms of historic structures.

Section 106 Summary. Under the Preferred Alternative, mitigation would be effective in preventing impacts to historic structures within the area of potential effect. After applying the Advisory Council on Historic Preservation's criteria of adverse effect (36 CFR 800.5), the National Park Service proposes that implementing the Preferred Alternative would result in a determination of *no adverse effect*.

Ethnographic Resources

Impact Intensity	Impact Type	Intensity Description
Negligible	Adverse or Beneficial	Impact is at the lowest levels of detection with neither adverse or beneficial consequences. The determination of effect for Section 106 would be <i>no adverse effect</i> .
Minor	Adverse	Disturbance of a site(s) results in little, if any, loss of integrity. The determination of effect for Section 106 would be <i>no adverse effect</i> .
	Beneficial	Maintenance and preservation of a site(s). The determination of effect for Section 106 would be <i>no adverse effect</i> .
Moderate	Adverse	Disturbance of a site(s) results in loss of integrity. The determination of effect for Section 106 would be <i>adverse effect</i> . A memorandum of agreement is executed among the National Park Service and applicable state or tribal historic preservation officer and, if necessary, the Advisory Council on Historic Preservation in accordance with 36 CFR 800.6(b).
	Beneficial	Stabilization of a site(s). The determination of effect for Section 106 would be <i>no adverse effect</i> .
Major	Adverse	Disturbance of a site(s) results in loss of integrity. The determination of effect for Section 106 would be <i>adverse effect</i> . Measures to minimize or mitigate adverse impacts cannot be agreed upon and the National Park Service and applicable state or tribal historic preservation officer and/or advisory council are unable to negotiate and execute a memorandum of agreement in accordance with 36 CFR 800.6(b).
	Beneficial	Active intervention to preserve a site(s). The determination of effect for Section 106 would be <i>no adverse effect</i> .

Ethnographic resources impacts are not usually considered short- or long- term because most ethnographic resources are nonrenewable. Once the resource is damaged, its integrity is often irreversibly diminished. However, some ethnographic resources, such as plants utilized for traditional healing and crafts, are renewable resources and impacts to those ethnographically important plants can be viewed as short- or long- term.

Currently there has been no systematic inventory of ethnographic resources for the South Rim Drive area. Without such an inventory, it is difficult to say if the Preferred Alternative would create impacts to these undocumented resources. If ethnographic resources exist in proximity to the proposed repaving areas, they might be subject to minor impacts, i.e., temporary and indirect. In general, no direct impacts are expected, because the project footprint remains essentially unchanged. The one possible exception is the parking area expansion at White House Ruin Overlook. As indicated in the Affected Environment section of this document, areas surrounding White House Overlook are of special spiritual significance to the Navajo. If the additional parking areas were to restrict access by the Navajo to these important areas, an adverse impact may result. As discussed in the Affected Environment section of this document, the White House Overlook parking area expansion will be designed to ensure that Navajo access to traditional use areas is maintained.

Certain unauthorized social roads may provide access to areas of plants used for traditional purposes. The Preferred Alternative could remove from use a number of these unauthorized social roads. However, discussions between local residents, the Navajo Tribe, and Monument staff would result in an inventory and evaluation of the roads that may be permanently removed from use. Through this process, access to these traditional plant areas would be maintained. Known ethnographic resources would be avoided in the road closure process through coordination with an NPS archeologist and Navajo representatives. Consequently,

closing the selected unauthorized social roads would result in a negligible impact to ethnographic resources.

Fencing is also proposed along the length of the roadways. This fence will be placed in previously disturbed areas within the road corridor or in other ways to avoid known ethnographic resources. In the vicinity of known ethnographic resources, the fence location will be determined by an NPS archeologist, road engineer, and Navajo representatives in coordination with other appropriate staff and/or interested parties.

Therefore, the Preferred Alternative is anticipated to result in negligible impacts to ethnographic resources.

Cumulative Impacts. Past, present, and reasonably foreseeable future construction, development, and resource management projects within the Monument and the surrounding region could contribute to permanent impacts to ethnographic resources. Past, present, and reasonably foreseeable future projects with the potential to affect ethnographic resources are listed above. Future projects would be subject to the Section 106 process. Consequently, it is assumed that impacts would range from negligible to moderately adverse. Moderate adverse impacts would be addressed through development of memorandums of agreement.

The Preferred Alternative is not anticipated to result in adverse contributions to cumulative effects. The overall cumulative effects of these past, present, and reasonably foreseeable future actions in conjunction with the Preferred Alternative would range from negligible to moderate. Moderate adverse impacts would be addressed through development of memorandums of agreement.

Conclusion. Potential impacts to ethnographic resources from the Preferred Alternative would be negligible. Overall cumulative impacts to ethnographic resources would range from negligible to moderate. Moderate adverse impacts would be addressed through development of memorandums of agreement.

Impairment of Park Resources and Values. Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the Monument's establishing legislation, (2) key to the natural or cultural integrity of the Monument or to opportunities for enjoyment of the Monument, or (3) identified as a goal in the Monument's procedures or other relevant National Park Service planning documents, there would be no impairment of ethnographic resources.

Section 106 Summary. Under the Preferred Alternative, mitigation would be effective in eliminating potential impacts to the ethnographic resources in the vicinity of the Preferred Alternative. After applying the Advisory Council on Historic Preservation's criteria of adverse effect (36 CFR 800.5), the National Park Service proposes that implementing the Preferred Alternative would result in a determination of *no adverse effect*.

Local Community

Impact Intensity	Intensity Definition
Negligible	Members of the local community would not be affected or impacts to the local community would be below or at the level of detection. Members of the local community would not likely be aware of the effects associated with the alternative.
Minor	Impacts to the local community would be detectable, although they would be slight. Some members of the local community would be aware of the effects associated with the alternative, but the effects would not be noticeable by most members of the community.
Moderate	Impacts to the local community would be readily apparent to most of the members of the community. Members of the community would be aware of the effects associated with the alternative and might express an opinion about the changes.
Major	Impacts to the local community would be readily apparent to all members of the community, severely adverse or exceptionally beneficial. Members of the local community would be aware of the effects associated with the alternative and would likely express a strong opinion about the changes.

During construction activities, residents would be impacted by construction delays related to lane closures, diversions, and overlook closures. Some delays would occur, but these delays would be limited to 5 minutes maximum in the vicinity of the Visitor Center and 15 minutes maximum elsewhere. Spur road and overlook parking area closures will be limited to a maximum of one at a time. Access to residential areas would be maintained at all times and construction activities would not impair local residents' ability to travel between the Monument and Chinle. School buses and emergency vehicles would be given priority through lane closure areas ensuring that delays are minimized.

As indicated above, residents would also be exposed to localized construction noise. Given the remote setting of the Monument, construction activities associated with the Preferred Alternative are not anticipated to affect visitation (i.e., the limited construction activities would not be anticipated to deter visitors already willing to travel out to the relatively remote Monument). Because the noise and other construction impacts are localized and will affect only a small portion of the Monument at any time, short-term impacts to local community would be adverse, but minor to moderate in nature.

After completion of the project, residents would benefit from the improved roadways. The repaired road surfaces, safety improvements, and improved signage would improve the driving experience and facilitate movement around the Monument and between the residential areas and Chinle. Livestock fencing installed along the road corridor, along with oversized culverts that may be incorporated, will reduce vehicle/livestock accidents thus improving resident driving experience and reducing livestock fatalities, as well as deter the use of social pullouts. Access to residences and other areas would be maintained through the fencing as necessary.

As discussed in the Affected Environment section of this document, local residents currently utilize a number of unpaved two-track roads within the Monument that the Monument considers unauthorized. Many of these roads are used by local residents to gain access to areas for traditional purposes. However, the presence of these roads has also occasionally led to the occurrence of undesirable activities such as illegal woodcutting, poaching, trespass, dumping, and drug use. The Preferred Alternative would result in the closure and obliteration of those unauthorized social roads that are determined to have no useful destination. While this would

preclude access by local residents to some areas, roads chosen for closure would be done in consultation with the local community. Only those roads agreed to by both the Monument and the local community would be closed. The closure of unnecessary roads would protect resources and would help to curb undesirable activities that are associated with the unauthorized social roads. In the long term, the Preferred Alternative would represent beneficial impacts to the local community.

Overall impacts to the local community from the Preferred Alternative would be minor to moderate and adverse in the short term, and in the long term beneficial.

Cumulative Impacts. Of the past, present, and reasonably foreseeable future projects listed in above, projects that could potentially impact the local community would be the water/wastewater pipeline construction, the watershed restoration and management program, addressing of vehicle impacts and restoration efforts, and assessment of the alterations of stream channels and crossing by individuals/concessionaires.

The water/wastewater pipeline would result in short- term impacts to the local residents during construction of the pipeline. In the long term, the pipeline would result in beneficial impacts to the local community as it would bring potable water and wastewater service to the local residents.

The remaining projects are intended to protect and better manage Monument resources. As such they could result in impacts to the local community if the projects were to result in changes to the use of Monument resources by the local community (e.g., restrict vehicle access). Because these projects are all in the planning stages, the effects on the local community are speculative at this time. Therefore, the cumulative effects of these projects on the local community will need to be addressed through the planning process.

The Preferred Alternative would provide minor to moderate adverse impacts to cumulative effects in the short term, and beneficial impacts in the long term.

Conclusion. The Preferred Alternative would constitute minor to moderate adverse short-term impacts, and long- term beneficial impacts to the local community.

CONSULTATION AND COORDINATION

SCOPING

The National Park Service, in cooperation with the Federal Highway Administration, Central Federal Lands Highway Division, is proposing to rehabilitate South Rim Drive in Canyon de Chelly National Monument, Arizona. Staff of Canyon de Chelly National Monument, the Federal Highway Administration, and resource professionals of the National Park Service, Denver Service Center, conducted internal scoping. This interdisciplinary process defined the purpose and need, identified potential actions to address the need, determined the likely issues and impact topics, and identified the relationship of the proposed action to other planning efforts at Canyon de Chelly National Monument.

Letters soliciting comments regarding preparation of the EA were sent to interested parties and potentially affected agencies on July 1, 2005 (included in Appendix A). Responses that were received pertaining to these letters are also contained in Appendix B. Informal and ongoing consultation has occurred with the U.S. Fish and Wildlife Service, the Navajo Nation Department of Fish and Wildlife, and the Navajo Nation Tribal Historic Preservation Officer.

Through ongoing consultations, as recently as October and November 2006, local residents have expressed a desire to protect livestock, residents, and visitors, as well as deter the use of social pullouts, by installing fencing along the affected roadways.

The community of Chinle, residents of Canyon de Chelly, local Chapter Houses, Navajo Nation Fish and Wildlife, Navajo Nation, USFWS, the public, American Indian groups traditionally associated with the lands of Canyon de Chelly National Monument, and other federal and state agencies will have an opportunity to review and comment on this environmental assessment / assessment of effect.

The undertakings described in this document are subject to Section 106 of the National Historic Preservation Act, as amended in 1992 (16 United States Code [USC] 470 et seq.). Certain previously unsurveyed portions of South Rim Drive were designated for survey by NPS staff in spring of 2006. A heritage resources survey of these portions of South Rim Drive was completed in June. The survey resulted in the documentation of 18 heritage resources. Seven of these sites were provisionally recommended as eligible to the National Register of Historic Places, all under Criterion D. Monitoring and/or fencing was recommended for archeological sites and historic structures in the APE to reduce adverse impacts to the negligible level.

A copy of this environmental assessment / assessment of effect will be sent to the Arizona State Historic Preservation Office and the Navajo Nation Historic Preservation Office for concurrence on the proposed project activities and historic resource protection. Should unknown archeological or other cultural resources be uncovered during construction, work would be halted in the discovery area, the site secured, and Canyon de Chelly National Monument would consult according to 36 CFR 800.13 and, as appropriate, provisions of the Native American Graves Protection and Repatriation Act of 1990.

In accordance with section 7(c) of the Endangered Species Act of 1973, as amended (16 USC 1531 et seq.), it is the responsibility of the federal agency proposing the action (in this case the National Park Service) to determine whether the proposed action would adversely affect any listed species or designated critical habitat. This determination of *may affect, not likely to adversely affect* is documented in the biological assessment and will be used in consultation with the U.S. Fish and Wildlife Service.

REGULATORY CITATIONS

Act of August 25, 1916 (National Park Service Organic Act), Public Law (PL) 64- 235, 16 USC 1 et seq. as amended

National Historic Preservation Act, as amended, PL 89- 665, 80 Stat. 915, 16 USC 470 et seq. and 36 CFR 18, 60, 61, 63, 68, 79, 800

Native American Graves Protection and Repatriation Act, PL 101- 601, 104 Stat. 3049, 25 USC 3001- 3013

Presidential Memorandum of April 29, 1994 "Government- to- Government Relations with Native American Tribal Governments," 59 FR 85

Clean Air Act, as amended, PL Chapter 360, 69 Stat. 322, 42 USC 5 7401 et seq.

Endangered Species Act of 1973, as amended, PL 93- 205, 87 Stat. 884, 16 USC 1531 et seq.

Executive Order 11988: Flood Plain Management, 42 FR 26951, 3 CFR 121(Supp 177)

Executive Order 11990: Protection of Wetlands, 42 FR 26961, 3 CFR 121(Supp 177)

Executive Order 11991: Protection and Enhancement of Environmental Quality

Executive Order 13007: Indian Sacred Sites (61 CFR 26771)

Farmland Protection Policy Act of 1982, PL 97- 98

Federal Water Pollution Control Act (commonly referred to as Clean Water Act), PL 92- 500, 33 USC 1251 et seq., as amended by the Clean Water Act, PL 95- 217

Fish and Wildlife Coordination Act of 1958, as amended, PL 85- 624, 72 Stat. 563, 16 USC 661 et seq.

National Environmental Policy Act of 1969, PL 91- 190, 83 Stat. 852, 42 USC 5 4321 et seq.

Programmatic Memorandum of Agreement among the National Park Service, Advisory Council on Historic Preservation, and the National Council of State Historic Preservation Officers (1995)

Protection and Enhancement of Environmental Quality, Executive Order 11514, as amended, 1970, Executive Order 11991, 35 *Federal Register* 4247;1977, 42 *Federal Register* 26967

Resource Conservation and Recovery Act, PL 94- 580, 30 Stat.1148, 42 USC 6901 et seq.

Secretarial Order 3175, Departmental Responsibility for Indian Trust Resources. Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (36 CFR 68)

Soil and Water Resources Conservation Act of 1977

Watershed Protection and Flood Prevention Act, PL 92- 419, 68 Stat. 666,16 USC 100186

AGENCY CONSULTATION AND PERMITTING

The following permits would be required prior to implementation of the proposed action:

Threatened and Endangered species surveys within the Monument require permits from the U.S. Fish and Wildlife Service.

Wildlife surveys within the Monument on Navajo Tribal Trust Lands require a wildlife permit from the Navajo Nation. NPS is responsible for obtaining these permits. The Monument has applied for and received Navajo Nation permits to conduct threatened and endangered species surveys inside the Monument and along the boundaries.

The FHWA is responsible for obtaining all construction permits.

LIST OF PREPARERS

This environmental assessment / assessment of effect was prepared by RECON Environmental, Inc., under the direction of the National Park Service. Denver Service Center and Canyon de Chelly National Monument staff provided invaluable assistance in the development and technical review of this environmental assessment / assessment of effect. National Park Service staff that provided information include:

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APPENDIXES

APPENDIX A

National Park Service Letters to Agencies Soliciting Comment on EA Preparation



**United States Department of the Interior
NATIONAL PARK SERVICE**

Canyon de Chelly National Monument
P.O. Box 588
Chinle, Arizona 86503



July 1, 2005

Marlene Thomas
Community Services Coordinator
Chinle Chapter
P.O. 1809
Chinle, Arizona 86503

RE: Canyon de Chelly South Rim Road Reconstruction Environmental Assessment

Dear Ms. Thomas:

The National Park Service (NPS) is initiating plans for the reconstruction and rehabilitation of the South Rim Road at Canyon de Chelly National Monument, Chinle, Apache County, Arizona. The proposed actions to be assessed include: rehabilitation and resurfacing of the roadway, shoulder improvements, measures to facilitate management of unauthorized roads and overlook points, additional range fencing or other measures to minimize livestock-vehicle collisions, intersection improvements, parking improvements at White House Overlook and the Visitor Center, and improvements to the public campground. The affected portion of the South Rim Road is approximately 11 miles long; there is no proposed increase in the width of the roadway. The proposed action also includes the rehabilitation and resurfacing or chip sealing of the overlook areas and spurs along the South Rim Road as required. The Monument is working closely with the Tribal Historic Preservation Office to ensure that potential adverse effects to cultural resources are avoided, minimized, or mitigated.

The monument will prepare an environmental assessment (EA) for the proposed project. In accordance with NEPA and 36 CFR 800 requirements, we are soliciting your comments and invite you to review the project. Please contact us with your initial concerns and comments. The Environmental Assessment will be prepared and will be sent to you for comment after that date.

If you would like to express your concerns, have questions, or need additional information, please contact me by writing at the above address. We would also be happy to arrange a meeting with you at your convenience to discuss this project. Please contact me through my email address, Scott_Travis@nps.gov, or by telephone at (928) 674-5500.

We look forward to consulting with you on this project.

Sincerely,

Scott Travis
Superintendent



**United States Department of the Interior
NATIONAL PARK SERVICE**

Canyon de Chelly National Monument
P.O. Box 588
Chinle, Arizona 86503



July 1, 2005

Navajo Nation
Environmental Protection Agency
P.O. Box 339
Window Rock, AZ 85616

Reference: Canyon de Chelly National Monument – South Rim Road Reconstruction
Subject: Compliance with Section 106 of the National Historic Preservation Act and National Environmental Policy Act (NEPA)

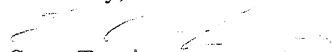
The National Park Service (NPS) is initiating an Environmental Assessment (EA) for the reconstruction and rehabilitation of the South Rim Road at Canyon de Chelly National Monument, Chinle, Apache County, Arizona. The proposed actions to be assessed include: rehabilitation and resurfacing of the roadway, shoulder improvements, measures to facilitate management of unauthorized roads and overlook points, additional range fencing or other measures to minimize livestock-vehicle collisions, intersection improvements, parking improvements at White House Overlook and the Visitor Center, and improvements to the public campground. The affected portion of the South Rim Road is approximately 11 miles long; there is no proposed increase in the width of the roadway. The proposed action also includes the rehabilitation and resurfacing or chip sealing of the overlook areas and spurs along the South Rim Road as required. The Monument is working closely with the Tribal Historic Preservation Office to ensure that potential adverse effects to cultural resources are avoided, minimized, or mitigated.

In accordance with NEPA and 36 CFR 800 requirements, we are soliciting your comments and invite you to review the project. Please contact us by with your initial concerns and comments. The Environmental Assessment will be prepared and will be sent to you for comment after that date.

If you would like to express your concerns, have questions, or need additional information, please contact me by writing at the above address. We would also be happy to arrange a meeting with you at your convenience to discuss this project. Please contact me through my email address, Scott_Travis@nps.gov, or by telephone at (928) 674-5500.

We look forward to consulting with you on this project.

Sincerely,


Scott Travis
Superintendent



**United States Department of the Interior
NATIONAL PARK SERVICE**

Canyon de Chelly National Monument
P.O. Box 588
Chinle, Arizona 86503



IN REPLY REFER TO:
PMIS # 107809

July 1, 2005

Mr. Alan Downer
Tribal Preservation Officer
Navajo Nation
Historic Preservation Department
P.O. Box 4950
Window Rock, AZ 86515

RE: Canyon de Chelly South Rim Road Reconstruction Environmental Assessment


Dear Mr. Downer:

The National Park Service (NPS) is initiating plans for the reconstruction and rehabilitation of the South Rim Road at Canyon de Chelly National Monument, Chinle, Apache County, Arizona. The proposed actions to be assessed include: rehabilitation and resurfacing of the roadway, shoulder improvements, measures to facilitate management of unauthorized roads and overlook points, additional range fencing or other measures to minimize livestock-vehicle collisions, intersection improvements, parking improvements at White House Overlook and the Visitor Center, and improvements to the public campground. The affected portion of the South Rim Road is approximately 11 miles long; there is no proposed increase in the width of the roadway. The proposed action also includes the rehabilitation and resurfacing or chip sealing of the overlook areas and spurs along the South Rim Road as required.

The monument will prepare an environmental assessment (EA) for the proposed project. Preparation of an EA is necessary to meet the requirements of the National Environmental Policy Act. In addition, the process and documentation required for preparation of the EA will be used to comply with §106 of the National Historic Preservation Act. In accordance with section 800.8(3)(c) of the Advisory Council on Historic Preservation's regulations (36 CFR Part 800), we are notifying your office in advance of the park's intention to use the EA to meet its obligations under §106.

We will contact you soon to discuss the proposed actions and other alternatives, as well as any ways to avoid, minimize, or mitigate potential adverse effects. If you have any questions or concerns, you may contact Elaine Leslie by telephone at (928) 674-5500 x225.

Sincerely,


Scott Travis
Superintendent



**United States Department of the Interior
NATIONAL PARK SERVICE**

Canyon de Chelly National Monument
P.O. Box 588
Chinle, Arizona 86503



July 1, 2005

Community Services Coordinator
Tsaile/Wheatfields Chapter
P.O. Box 667
Tsaile, Arizona 86556

RE: Canyon de Chelly South Rim Road Reconstruction Environmental Assessment

The National Park Service (NPS) is initiating plans for the reconstruction and rehabilitation of the South Rim Road at Canyon de Chelly National Monument, Chinle, Apache County, Arizona. The proposed actions to be assessed include: rehabilitation and resurfacing of the roadway, shoulder improvements, measures to facilitate management of unauthorized roads and overlook points, additional range fencing or other measures to minimize livestock-vehicle collisions, intersection improvements, parking improvements at White House Overlook and the Visitor Center, and improvements to the public campground. The affected portion of the South Rim Road is approximately 11 miles long; there is no proposed increase in the width of the roadway. The proposed action also includes the rehabilitation and resurfacing or chip sealing of the overlook areas and spurs along the South Rim Road as required. The Monument is working closely with the Tribal Historic Preservation Office to ensure that potential adverse effects to cultural resources are avoided, minimized, or mitigated.

The monument will prepare an environmental assessment (EA) for the proposed project. In accordance with NEPA and 36 CFR 800 requirements, we are soliciting your comments and invite you to review the project. Please contact us with your initial concerns and comments. The Environmental Assessment will be prepared and will be sent to you for comment after that date.

If you would like to express your concerns, have questions, or need additional information, please contact me by writing at the above address. We would also be happy to arrange a meeting with you at your convenience to discuss this project. Please contact me through my email address, Scott_Travis@nps.gov, or by telephone at (928) 674-5500.

We look forward to consulting with you on this project.

Sincerely,

Scott Travis
Superintendent



**United States Department of the Interior
NATIONAL PARK SERVICE**

Canyon de Chelly National Monument
P.O. Box 588
Chinle, Arizona 86503



July 1, 2005

Mr. Jeff Cole
Navajo Department of Fish & Wildlife
P.O. Box 1480
Window Rock, AZ 86515

RE: Request for Information Regarding Navajo Nation Special Status Species and Habitat Concerns

Dear Mr. Cole,

The National Park Service (NPS) is initiating an Environmental Assessment (EA) for the reconstruction and rehabilitation of the South Rim Road at Canyon de Chelly National Monument, Chinle, Apache County, Arizona. The proposed actions to be assessed include: rehabilitation and resurfacing of the roadway, shoulder improvements, measures to facilitate management of unauthorized roads and overlook points, additional range fencing or other measures to minimize livestock-vehicle collisions, intersection improvements, parking improvements at White House Overlook and the Visitor Center, and improvements to the public campground. The affected portion of the South Rim Road is approximately 11 miles long; there is no proposed increase in the width of the roadway. The proposed action also includes the rehabilitation and resurfacing or chip sealing of the overlook areas and spurs along the South Rim Road as required.

This correspondence is a request for information on occurrence records you may have of special status species within or near the project area, and habitat issues or any other concerns your agency may have regarding the project area.

In order to meet project schedules, we would appreciate your response as soon as possible. Please send the information to the attention of:

Elaine Leslie
Canyon de Chelly National Monument
P. O. Box 588
Chinle, Arizona 86503

Please contact Elaine at 928/674-5500 x225 if you have any questions or comments. We appreciate your continuing assistance with National Park Service projects.

Sincerely,

Scott Travis
Superintendent
Canyon de Chelly National Monument



**United States Department of the Interior
NATIONAL PARK SERVICE**

Canyon de Chelly National Monument
P.O. Box 588
Chinle, Arizona 86503



July 1, 2005

U.S. Fish and Wildlife Service
Arizona Ecological Services Field Office
Mr. Steve Spangle, Field Supervisor
2321 West Royal Palm Road, Suite 103
Phoenix, Arizona 85021

Reference: Canyon de Chelly South Rim Road Reconstruction Environmental Assessment

Subject: Current List of Federally Listed Threatened and Endangered Species

Dear Mr. Spangle:

The National Park Service (NPS) is initiating an Environmental Assessment (EA) for the reconstruction and rehabilitation of the South Rim Road at Canyon de Chelly National Monument, Chinle, Apache County, Arizona. The proposed actions to be assessed include: rehabilitation and resurfacing of the roadway, shoulder improvements, measures to facilitate management of unauthorized roads and overlook points, additional range fencing or other measures to minimize livestock-vehicle collisions, intersection improvements, parking improvements at White House Overlook and the Visitor Center, and improvements to the public campground. The affected portion of the South Rim Road is approximately 11 miles long; there is no proposed increase in the width of the roadway. The proposed action also includes the rehabilitation and resurfacing or chip sealing of the overlook areas and spurs along the South Rim Road as required.

We are requesting a current list of federally listed threatened or endangered species, species of concern, or any other special status species that might occur in the locality mentioned above, and designated critical habitats, if any, for these species. In addition, please include any special considerations that you may have regarding this project.

In order to meet project schedules, we would appreciate your response as soon as possible. Please send the information to the attention of:

Elaine Leslie
Canyon de Chelly National Monument
P. O. Box 588
Chinle, Arizona 86503

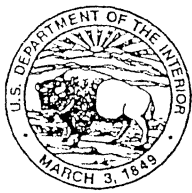
Please contact Elaine at 928/674-5500 x225 if you have any questions or comments. We appreciate your continuing assistance with National Park Service projects.

Sincerely,

Scott Travis
Superintendent
Canyon de Chelly National Monument

APPENDIX B

Consultation and Coordination Letters



United States Department of the Interior

U.S. Fish and Wildlife Service
Arizona Ecological Services Field Office
2321 West Royal Palm Road, Suite 103
Phoenix, Arizona 85021-4951

Telephone: (602) 242-0210 Fax: (602) 242-2513



In Reply Refer to:

AESO/SE
02-21-05-I- 0825

October 11, 2005

Mr. Scott Travis
Canyon de Chelly National Monument
P. O. Box 588
Chinle, Arizona 86503

Dear Mr. Travis:

Thank you for your correspondence of July 1, 2005, received in our office September 6, requesting our comments on the South Rim Road Reconstruction, involving about 11 miles of existing road in Canyon de Chelly National Monument (Monument), Apache County, Arizona. This letter documents our recommendations regarding threatened and endangered species, critical habitat, species proposed to be listed, or critical habitat proposed to be designated, under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) (Act).

The Arizona Ecological Services Field Office has posted lists of candidate, proposed, threatened, and endangered species, and relevant designated or proposed critical habitat, for all of Arizona's counties on the Internet. Please refer to the website <http://arizonaes.fws.gov> for species information for the county where your project occurs. If you have difficulty obtaining a list, please contact our office and we will mail or fax you one. For future projects it is not necessary to contact our office to obtain a species list if you choose to access our website directly.

On the webpage's left side choose "Threatened & Endangered". Scroll down to the state map and click the county of choice. Species information includes status, counties of occurrence, and a summary of the species' physical description, elevation range and habitat, and some general comments including citations for Federal Register (FR) notices. (The FR is available at most public libraries and on the Internet.) At our website, more information for each species can be obtained at the main page by clicking on "Document Library" and "Documents by Species".

Please note that your action area may not include all or any of the species listed on our webpage. The information at our site and in the FR should be useful to you in determining which species may occur within the action area. Site-specific surveys may be needed to determine the presence of a species or its habitat, in order to complete the analysis of project-related effects.

Threatened and endangered species are protected by Federal law and must be considered prior to project development. If the action agency determines that listed species or critical habitat *may be affected* by a federally funded, permitted or authorized activity, the agency must consult with us. Note that a “may affect” determination includes effects that may not be adverse and that may be beneficial, insignificant, or discountable. An effect exists even if only one individual or habitat segment may be affected. The effects analysis should include the entire action area, which often extends well outside the “footprint” of the project (e.g., downstream). If the agency determines that the action may jeopardize a proposed species or adversely modify proposed critical habitat, the agency must enter into a section 7 conference. Candidate species, which may be listed on our webpage, are those for which there is sufficient information to support a proposal for listing. Although candidate species have no legal protection under the Act, we recommend that they be considered in the planning process in the event they become proposed or listed prior to project completion.

Based on prior discussions with the National Park Service last year about the development of a General Management Plan (GMP) for the Monument, the following federally listed species may occur in the general area of the action: bald eagle (*Haliaeetus leucocephalus*; threatened), California condor (*Gymnogyps californianus*; endangered), Mexican spotted owl (*Strix occidentalis lucida*; threatened), Navajo sedge (*Carex specuicola*; threatened), southwestern willow flycatcher (*Empidonax traillii extimus*; endangered) and Zuni fleabane (*Erigeron rhizomatus*; threatened). Candidate species that may occur include: yellow-billed cuckoo (*Coccyzus americanus*) and Zuni bluehead sucker (*Catostomus discobolus yarrowi*). Also, there are historical records of Goodings onion (*Allium goodingii*) in the upper reaches of canyons on the east end of the Monument. This species is a former candidate that is now protected under a conservation agreement between the Fish and Wildlife Service and the U. S. Forest Service.

In 1996 the California condor (condor) was reintroduced as a non-essential experimental population to Vermillion Cliffs, about 130 miles from the Monument. The eastern boundary of the experimental population area is U.S. Highway 191, just west of the Monument. Condors are capable of traveling long distances in a short period of time (e.g., 200 miles/day). As of 2002, condor movements have been documented 125 miles or more from the release site at Vermillion Cliffs on five occasions. The most eastward movement was in the general area of Grand Mesa, Colorado, 275 miles from the release site. Within the last two years condors have been roosting, on a seasonal basis, in the Kolob area of Zion National Park about 65 miles from Vermillion Cliffs. Like many scavengers, condors are very curious, and some may be drawn to human activity such as construction. For the Monument’s GMP we recommended that the Park Service develop a plan of action if condors are documented in the vicinity of the Monument, and provided several measures that may be incorporated into that plan. Please contact us if you need a copy of those measures.

In addition to species listed under the Act, we recommend you consider species protected under the Migratory Bird Treaty Act (MBTA). The MBTA prohibits the take of species on the list of migratory birds (see Section 10.13, Title 50 of the Code of Federal Regulations).

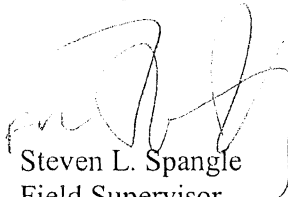
If the road passes through or along areas with riparian vegetation, we recommend the protection of these areas. Riparian areas are essential to biological community diversity and provide linear

corridors important to migratory species. In addition, if the project will result in deposition of dredged or fill materials into waters of the United States, we advise contacting the U.S. Army Corps of Engineers, which regulates these activities under Section 404 of the Clean Water Act.

In keeping with our trust responsibilities to Native American Tribes, by copy of this memorandum we will notify the Navajo Nation, which may be affected by this proposed action, and encourage you to invite the Bureau of Indian Affairs to participate in the review of this project. We also recommend you contact the Navajo Nation Department of Fish and Wildlife (NNDFWL) for assistance in determining if any Tribally-listed species may occur in your project area. Federal law does not protect all Tribally-listed species. The NNDFWL also houses a natural heritage program (NNHP), which is a database of rare, threatened, and endangered species for the Navajo Nation. The NNHP data provide a more site-specific accounting of species occurrence records that, when used in conjunction with our species by county information, can help identify species occurring in the action area. Because there are areas of the Navajo Nation that have not been inventoried for species of concern and inventory information can become quickly outdated, occurrence records should not be used to rule out the presence of a species, nor should they substitute for on-site surveys.

Thank you for the opportunity to comment on the proposed project. In future communication regarding this project, please refer to consultation number 02-21-04-I-0825. If you need more assistance or have any questions, please contact John Nystedt (x104) or Brenda Smith (x101) of our Flagstaff Suboffice at (928) 226-0614. Thank you for your continued efforts to conserve endangered species.

Sincerely,



Steven L. Spangle
Field Supervisor

cc: President, Navajo Nation, Window Rock, AZ
NEPA Coordinator, Environmental Services, Navajo Regional Office, Bureau of Indian Affairs, Gallup, NM

APPENDIX C

Navajo Nation Endangered Species List

NAVAJO NATION
DIVISION OF NATURAL RESOURCES
DEPARTMENT OF FISH AND WILDLIFE

NAVAJO ENDANGERED SPECIES LIST
Resources Committee Resolution
No. RCMA-31-01

March 2001

GROUP 1: Those species or subspecies that no longer occur on the Navajo Nation.

GROUP 2 (G2) & GROUP 3 (G3): “Endangered” -- Any species or subspecies whose prospects of survival or recruitment within the Navajo Nation are in jeopardy or are likely within the foreseeable future to become so.

G2: A species or subspecies whose prospects of survival or recruitment are in jeopardy.

G3: A species or subspecies whose prospects of survival or recruitment are likely to be in jeopardy in the foreseeable future.

GROUP 4: Any species or subspecies for which the Navajo Nation Department of Fish and Wildlife (NNDFWL) does not currently have sufficient information to support their being listed in G2 or G3 but has reason to consider them. The NNDFWL will actively seek information on these species to determine if they warrant inclusion in a different group or removal from the list.

The NNDFWL shall determine the appropriate group for listing a species or subspecies due to any of the following factors:

1. The present or threatened destruction, modification, or curtailment of its habitat;
2. Over-utilization for commercial, sporting or scientific purposes;
3. The effect of disease or predation;
4. Other natural or man-made factors affecting its prospects of survival or recruitment within the Navajo Nation; or
5. Any combination of the foregoing factors.

NAVAJO ENDANGERED SPECIES LIST – March 2001

Scientific name (Common name)

GROUP 1:

MAMMALS

Canis lupus (Gray Wolf)
Lontra canadensis (Northern River Otter)
Ursus arctos (Grizzly or Brown Bear)

BIRDS

Centrocercus minimus (Gunnison Sage-Grouse)

FISHES

Gila elegans (Bonytail)

GROUP 2:

MAMMALS

Mustela nigripes (Black-footed Ferret)

BIRDS

Empidonax traillii extimus (Southwestern Willow Flycatcher)

AMPHIBIANS

Rana pipiens (Northern Leopard Frog)

FISHES

Gila cypha (Humpback Chub)
Gila robusta (Roundtail Chub)
Ptychocheilus lucius (Colorado Pikeminnow)
Xyrauchen texanus (Razorback Sucker)

PLANTS

Astragalus humillimus (Mancos Milk-vetch)
Erigeron rhizomatus (Rhizome Fleabane)
Pediocactus bradyi (Brady Pincushion Cactus)

GROUP 3:

MAMMALS

Antilocapra americana (Pronghorn)*
Ovis canadensis (Bighorn Sheep)

BIRDS

Aquila chrysaetos (Golden Eagle)
Buteo regalis (Ferruginous Hawk)
Cinclus mexicanus (American Dipper)
Coccyzus americanus (Yellow-billed Cuckoo)
Strix occidentalis lucida (Mexican Spotted Owl)

INVERTEBRATES

Speyeria nokomis (Western Seep Fritillary)

PLANTS

Allium gooddingii (Gooding's Onion)
Astragalus cremonophylax var. *hevroni* (Marble Canyon Milk-vetch)
Astragalus cutleri (Cutler's Milk-vetch)
Carex specuicola (Navajo Sedge)
Erigeron acomanus (Acoma Fleabane)
Pediocactus peeblesianus var. *fickeiseniae* (Fickeisen Plains Cactus)
Penstemon navajoa (Navajo Penstemon)
Platanthera zothecina (Alcove Bog-orchid)
Sclerocactus mesae-verdae (Mesa Verde Cactus)

*G3 designation **excludes** NNDFWL Management Unit 16 ('New Lands'), the boundaries of which are: From Sanders, AZ east along Unit 4 boundary to the Zuni boundary; south along the boundary past AZ Hwy 61 to the Navajo Nation/state boundary; west along the boundary past US Hwy 666 to the Navajo Nation/state boundary; north along Rd 2007 to Navajo, AZ; west (to the north and south of Interstate 40) to the state/Petrified Forest National Park boundary; north along the boundary to the Unit 8 boundary; east along the boundary to US Hwy 191; south to Chambers and east to Sanders. For a Unit 16 map, contact NNDFWL, P.O. Box 1480, Window Rock, AZ, 86515, (520) 871-6451.

NAVAJO ENDANGERED SPECIES LIST – March 2001

Scientific name (Common name)

GROUP 4:

MAMMALS

Dipodomys microps (Chisel-toothed Kangaroo Rat)
Microtus mexicanus (= *mogollonensis*) (Navajo Mountain Vole)
Plecotus townsendii (Townsend's Big-eared Bat)
Vulpes macrotis (Kit Fox)

BIRDS

Accipiter gentilis (Northern Goshawk)
Aechmophorus clarkii (Clark's Grebe)
Aegolius acadicus (Northern Saw-whet Owl)
Ceryle alcyon (Belted Kingfisher)
Charadrius montanus (Mountain Plover)
Columba fasciata (Band-tailed Pigeon)
Dendragapus obscurus (Blue Grouse)
Dendroica petechia (Yellow Warbler)
Empidonax hammondii (Hammond's Flycatcher)
Falco peregrinus (Peregrine Falcon)
Glaucidium gnoma (Northern Pygmy-Owl)
Otus flammeolus (Flammulated Owl)
Picoides tridactylus (Three-toed Woodpecker)
Porzana carolina (Sora)
Tachycineta bicolor (Tree Swallow)

REPTILES

Lampropeltis triangulum (Milk Snake)
Sauromalus ater (Chuckwalla)

FISHES

Catostomus discobolus (Bluehead Sucker)
Cottus bairdi (Mottled Sculpin)

INVERTEBRATES

Oxyloma kanabense (Kanab Ambersnail)

PLANTS

Amsonia peeblesii (Peebles Blue-star)
Asclepias sanjuanensis (San Juan Milkweed)
Asclepias welshii (Welsh's Milkweed)
Astragalus cronquistii (Cronquist Milk-vetch)
Astragalus naturitensis (Naturita Milk-vetch)
Astragalus sophoroides (Painted Desert Milk-vetch)
Astragalus tortipes (Sleeping Ute Milk-vetch)
Camissonia atwoodii (Atwood's Camissonia)
Clematis hirsutissima var. *arizonica* (Arizona Leather Flower)
Cryptantha atwoodii (Atwood's Catseye)
Cymopterus acaulis var. *higginsii* (Higgins Biscuitroot)
Cystopteris utahensis (Utah Bladder-fern)
Erigeron sivinskii (Sivinski's Fleabane)
Errazurizia rotundata (Round Dunebroom)
Lesquerella navajoensis (Navajo Bladderpod)
Perityle specuicola (Alcove Rock Daisy)
Phacelia indecora (Bluff Phacelia)
Phacelia welshii (Welsh Phacelia)
Puccinella parishii (Parish's Alkali Grass)



As the nation's principal conservation agency, the Department of the Interior has the 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 historic places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people 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.

