Flagstaff Area National Monuments

National Park Service
U.S. Department of the Interior

Flagstaff Area National Monuments
Arizona

Environmental Assessment / Assessment of Effect
Route 10 Rehabilitation

September 2005

United States Department of the Interior

NATIONAL PARK SERVICE
Wupatki-Sunset Crater Volcano-Walnut Canyon
National Monuments
6400 N. Highway 89
Flagstaff, Arizona 86004

IN REPLY REFER TO:

D30 (WUPA 59728)

SEP 1 9 2008

Dear Interested Party:

At Wupatki National Monument, Coconino County, Arizona, the National Park Service proposes to rehabilitate 16 miles of Route 10 (U.S. Forest Service Road 545), beginning at the south boundary of Wupatki and ending at the northern junction with U.S. 89, and rehabilitate and repair various other road sections and parking lots for pullouts and parking areas.

Enclosed is an Environmental Assessment (EA) that details the National Park Service proposal. The EA is also available for public review on the World Wide Web at http://parkplanning.nps.gov. Once at the park planning web site, please click on *Plans/Documents Open for Comment*, then scroll down to *Route 10 Rehabilitation Environmental Assessment/Assessment of Effect.*

Two alternatives are described and their environmental consequences assessed. Alternative A is the no action alternative. Alternative B is the National Park Service's preferred alternative. The environmentally preferred alternative is Alternative B.

We welcome your input on the project and our intended efforts to avoid adverse effects on park resources. The public comment period closes 30 calendar days after the date at the top of this letter. If you wish to comment on the EA, you may e-mail comments through the park planning web site, as noted above. If you prefer to send comments through regular mail, please send to:

Superintendent
Flagstaff Area National Monuments - WUPA
6400 North Hwy 89
Flagstaff, AZ 86004

Our practice is to make comments, including names and home addresses of respondents, available for public review during regular business hours. Individual respondents may request that we withhold their home address from the record, which we will honor to the extent allowable by law. There also may be circumstances in which we would withhold from the record a respondent's identity, as allowable by law.

If you wish us to withhold your name and/or address, you must state this prominently at the beginning of your comment. We will make all submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, available for public inspection in their entirety.

Thank you for participating in the planning process for the road rehabilitation project at Wupatki National Monument. We look forward to hearing your comments on the project.

Sincerely,

Palma E. Wilson

Palma E. Wilson,
Superintendent

Environmental Assessment / Assessment of Effect
Route 10 Rehabilitation

Prepared For:
National Park Service

Flagstaff Area National Monuments
Arizona

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

Environmental Assessment / Assessment of Effect
Route 10 Rehabilitation

Flagstaff Area National Monuments
Coconino County, Arizona

Summary

This environmental assessment / assessment of effect examines in detail two alternatives: no action and the National Park Service preferred alternative. The preferred alternative considers rehabilitating 16 miles of Route 10 (U.S. Forest Service Road 545), beginning at the south boundary of Wupatki National Monument (Wupatki) and ending at the northern junction with U.S. Highway 89. The work would also include placement of a 2-inch overlay for an additional 5 miles of Route 10 between Sunset Crater Volcano National Monument (Sunset Crater) and Wupatki, and repair of several sections of previously completed road work in Sunset Crater that are experiencing raveling edges and drainage problems. Parking areas and turnouts within the 16 miles of the Route 10 project would also be rehabilitated as part of the proposed project, including the Citadel Pueblo parking area, the Wupatki Visitor Center parking area the Doney Crater picnic area, the Pithouse turnout, and the Painted Desert turnout. Approximately 29 existing turnouts would be eliminated and the areas would be reclaimed. One mile of poorly compacted cinder shoulders would be replaced on previously completed road work in Sunset Crater. Additional work would occur at the Wupatki Visitor Center including a 2-inch overlay on an access road to the maintenance and housing area, south of the visitor center; and additional landscaping, benches, a drinking fountain, and a wheelchair-accessible picnic area along the walkway approach to the visitor center. This action is needed because the overall condition of Route 10 is fair to poor, with large sections of thermal, longitudinal, transverse, and block cracking with narrow shoulders and raveling edges in many locations; parking areas and turnouts are not adequately designed for maneuverability and have limited parking spaces; there is no formal gate to close the Citadel Pueblo parking area as prescribed in the *Final Environmental Impact Statement and General Management Plan, Wupatki National Monument*; and the current Painted Desert turnout location is confusing for visitors. The 2-inch overlay and repair of previously rehabilitated road sections would stop further deterioration and extend the life of these sections.

The work would be completed under a Federal Highway Administration design and construction contract, using National Park Service Federal Lands Highway Program funding and in cooperation with the U.S. Forest Service. Although Route 10 is administered by the National Park Service, portions of the road lie within the Coconino National Forest.

The preferred alternative would have no or negligible impacts on geology, air quality, water resources, water quality, cultural landscapes, ethnographic resources, museum objects, health and safety, socioeconomics, prime and unique farmland, land use, soundscapes, lightscapes, visual and scenic resources, designated critical habitat, ecologically critical areas, wild and scenic rivers, other unique natural areas, environmental justice, and Indian trust resources. No federally listed threatened or endangered species are known to occur within the area of potential effect.

Short-term, localized, negligible, adverse effects would occur to monument operations and plant species of concern. Short-term, moderate, adverse impacts would occur to visitor use and experience and monument neighbors and other agencies. Long-term, minor, adverse impacts would occur to historic structures and districts and archeological resources. Long-term, minor to moderate, beneficial impacts would occur to monument operations. Long-term, moderate, beneficial impacts would occur to visitor use and experience and monument neighbors and other agencies. Impacts to animal species of concern from these projects would

be localized, short term, negligible, and adverse. Long-term impacts to animal species of concern range from no long-term impacts to the Wupatki pocket mouse, ferruginous hawk, and Western burrowing owl; to long-term, minor, beneficial impacts to the pronghorn antelope and golden eagle.

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LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

CCC	Civilian Conservation Corps
CFR	Code of Federal Regulations
EA	environmental assessment / assessment of effect
NEPA	National Environmental Policy Act of 1969
NPS	National Park Service
NRHP	National Register of Historic Places
SHPO	State Historic Preservation Office
USFS	U.S. Forest Service
USC	United States Code

INTRODUCTION

PURPOSE AND NEED

At Wupatki National Monument (Wupatki) and Sunset Crater Volcano National Monument (Sunset Crater), Coconino County, Arizona, the National Park Service (NPS), in cooperation with the U.S. Forest Service (USFS) and the Federal Highway Administration, proposes to rehabilitate 16 miles of Route 10 (U.S. Forest Service Road 545), beginning at the south boundary of Wupatki and ending at the northern junction with U.S. Highway 89 (U.S. 89) (figure 1); place a 2-inch overlay on an additional 5 miles of Route 10 between Sunset Crater and Wupatki; repair several sections of previously completed road work in Sunset Crater; rehabilitate selected parking areas and turnouts at the Citadel Pueblo parking area, the Wupatki Visitor Center parking area, the Doney Crater picnic area, the Pithouse turnout, and the Painted Desert turnout; and replace 1 mile of poorly compacted cinder shoulders on previously completed road work in Sunset Crater. Approximately 29 turnouts would be eliminated and these areas would be reclaimed. Additional work would occur at the Wupatki Visitor Center, including a 2-inch overlay on an access road to the maintenance and housing area south of the visitor center; and additional landscaping, benches, a drinking fountain, and a wheelchair-accessible picnic area would be installed along the walkway approach to the visitor center.

Route 10 is a loop road that intersects with U.S. 89 at either end of the road. The road serves as access and a through route for both Sunset Crater and Wupatki, as well as allowing local neighbors a commuting route to Flagstaff or the surrounding area. The southern end of Route 10 that runs through Sunset Crater was rehabilitated in 2003 as the first phase of the overall rehabilitation of the entire route. The first phase included rehabilitation of approximately 14 miles of roadway. This environmental assessment / assessment of effect (EA) addresses phase two of the planning process for rehabilitation of the remaining 16 miles of Route 10 and placement of a 2-inch overlay on 5 miles of Route 10 between Wupatki and Sunset Crater. In addition, portions of the first phase are in need of repair and that work would also occur during phase two. The purpose of the project is to provide a safe driving surface for monument visitors, monument neighbors, and other agencies traveling to and from their residences, provide adequate parking in designated parking areas, maintain the existing traffic route through the monument while providing adequate protection for natural and cultural resources, and extending the life of the road.

This action is needed because:

1. The overall condition of Route 10 is fair to poor, with large sections of thermal, longitudinal, transverse, and block cracking, with narrow shoulders and raveling edges in many locations.
2. The parking areas and turnouts are not adequately designed for maneuverability and have limited parking spaces.

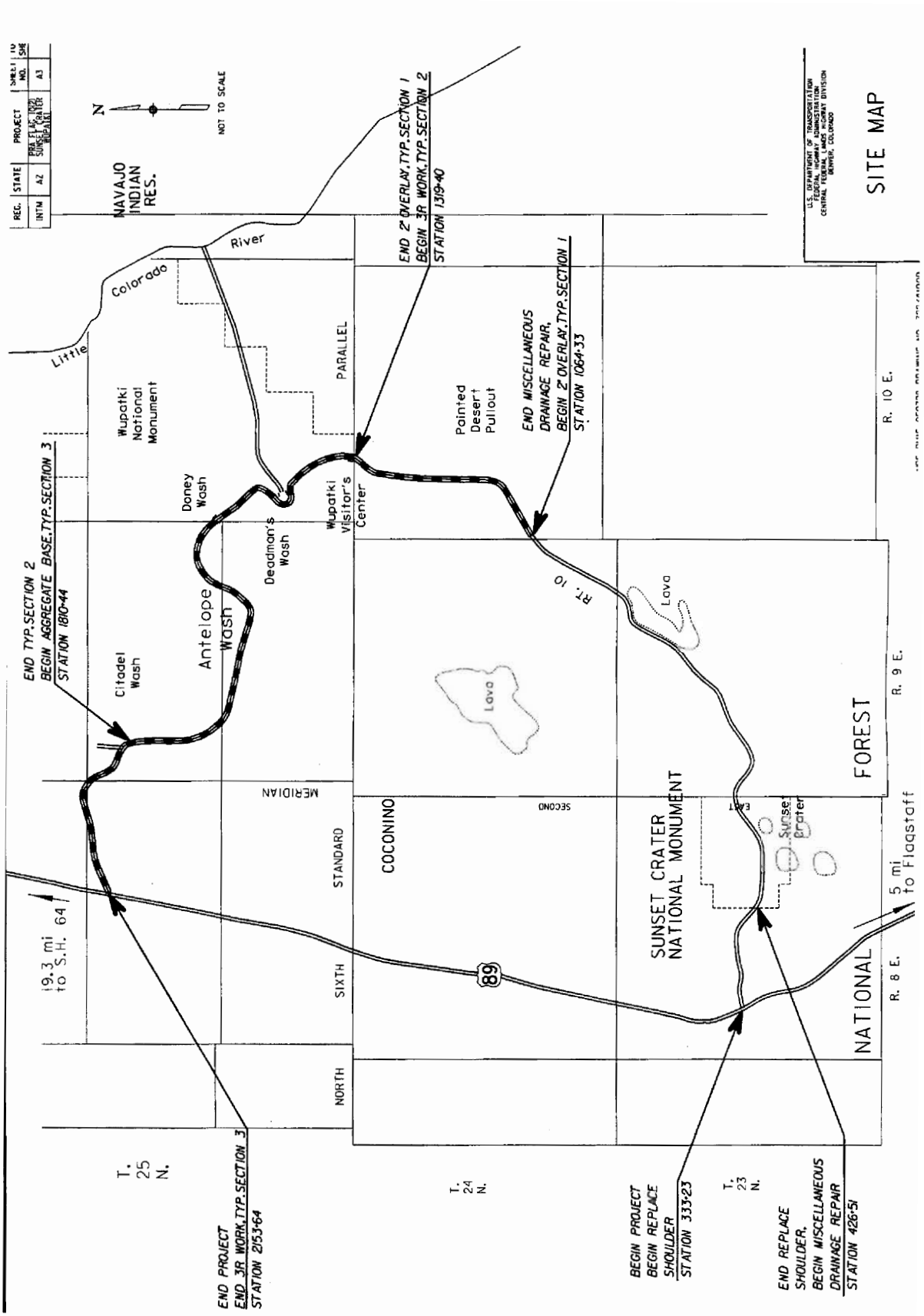

FIGURE 1. PROJECT LOCATION MAP [NPS-DSC 322/20021]

3. The 2-inch overlay and repair of previously rehabilitated road sections would stop further deterioration and extend the life of these sections.
4. The current Painted Desert turnout location is on a curve, which makes visitor access confusing.

An environmental assessment analyzes the preferred alternative and other alternatives and their impacts on the environment. This EA has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA) and regulations of the Council on Environmental Quality (40 *Code of Federal Regulations* (CFR) 1508.9); National Park Service Director's Order – 12: *Conservation Planning, Environmental Impact Analysis, and Decision-making*; and the National Historic Preservation Act of 1966 (as amended).

PURPOSE AND SIGNIFICANCE OF THE NATIONAL MONUMENTS

An essential part of the planning process is to understand the purpose, significance, and mission of the monuments for which this EA is being prepared. Wupatki was originally set aside to preserve and interpret several large pueblos with standing architecture: Wupatki, Wukoki, Citadel, Nalakihu, Lomaki, and the two Box Canyon pueblos. However, the vast majority of recorded sites in the monument are small unit pueblos or pithouse villages with fewer than six rooms (NPS 2002a). Sunset Crater was set aside to provide proper protection for certain geologic formations (NPS 2002b).

Monument Purpose

Purpose statements are based on legislation, legislative history, and National Park Service policies. The statements reaffirm the reasons for which the monument was set aside as a unit of the national park system, and provides the foundation for the management and use of the monument.

The purpose of Wupatki National Monument is to:

> *Preserve, protect, care for, and manage the ancestral Hopi sites, other prehistoric remains, and cultural and natural resources of historic ethnographic and scientific interest located within Wupatki National Monument (NPS 2002a).*

Monument Significance

Monument significance statements capture the essence of the monument's importance to the natural and cultural heritage of the United States of America. Significance statements do not inventory monument resources; rather, they describe the monument's distinctiveness and help place the area within the regional, national, and international context. Defining significance helps monument managers make decisions that preserve the resources and values necessary to accomplish the purpose of the monument.

The following significance statements have been developed for Wupatki National Monument:

- Wupatki is the only known location in the Southwest where physical evidence from at least three archeologically separate ancestral puebloan cultures is found together in a number of archeological sites. According to Puebloan oral tradition, Wupatki represents one ancestral Puebloan group.

- The natural and cultural resources within the monument are known to be significant to contemporary native tribes, as evidenced by oral history and continuing practices and the archeological record.

- Many prehistoric and historic sites are well preserved and have a high degree of cultural resource integrity.

- Historic material reveals a rich record of human endeavor left by Navajo families over a period of 150 years and continuing through the present day; and by ranchers, sheepherders, prospectors, Mormons, the Civilian Conservation Corps (CCC), monument custodians, and the Museum of Northern Arizona. Their activities, combined with environmental changes, have created complex cultural landscapes within the monument.

- Wupatki protects one of the few native grasslands in the Southwest that is not being domestically grazed, and its integrity is essential to perpetuating native species and natural ecosystem processes.

- The setting of Wupatki, undeveloped and largely unpolluted, provides the exceedingly rare opportunity to see for more than 60 miles, view the night sky, and encounter quiet—an experience comparable to that experienced by prehistoric peoples. These qualities are a baseline against which change can be monitored, managed, and mitigated (NPS 2002a).

Monument Mission

The monument's purpose describes the specific reason the monument was established. Monument significance is the distinctive features that make the monument unique from any other. Together, purpose and significance lead to a concise statement—the mission of the monument. The mission statement describes conditions that exist when the legislative intent for the monument is being met.

Administratively, the three parks of the Flagstaff area (Wupatki, Sunset Crater, and Walnut Canyon National Monument) were combined under one superintendent in 1990. As a result, many planning documents refer to the three parks as the Flagstaff Area National Monuments. The mission statement of Wupatki National Monument, as part of the Flagstaff Area National Monuments:

The Flagstaff Area National Monuments preserve, protect, and interpret for ethnographic, scientific, and educational purposes, the dwellings, artifacts, and other evidence of prehistoric and historic occupation; the geologic formations created by the region's most recent volcanic activity; and the landscapes, flora, and fauna which still reflect these human and natural influences (NPS 2002a, NPS 2002b).

THE PURPOSE OF PARK ROADS

The purpose of a national park road is summarized in the "Park Road Design" memorandum dated February 20, 1986, from then National Park Service Director Mott:

> *"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 *National Park Service Park Roads Standards*, among all public resources, those of the national park system are distinguished by their unique natural, cultural, scenic, and recreational qualities; values that are dedicated and set aside by public law to be preserved for the benefit and enjoyment of people in such manner as will leave them unimpaired for future generations. Pragmatically, the protection, use, and enjoyment of park resources in a world of modern technology has necessitated the development of a system of public park roads. In most parks today, the basic means of providing for visitor and park administrative access is the park road system. It enables visitors to stop and access the park resources for which the park was created or to simply enjoy the experience of driving the road and viewing the park through the drive. Park roads also provide essential management access. Roads in national parks are unique in that park roads serve a distinctly different purpose from most other road and highway systems. Therefore, national park system road standards must also be unique.

The purpose of national parks—bringing humankind and the environment into closer harmony while balancing resource values and preservation—dictates that the quality of the park experience must be a primary consideration. Full use and enjoyment of a national park visit depends on its being a safe and leisurely experience. The distinctive character of park roads plays a basic role in setting this essential unhurried pace; generally, park roads are designed and planned for leisurely sightseeing. Additionally, park roads are designed with extreme care and sensitivity with respect to the natural, cultural, scenic, and recreational areas through which they pass. Unequivocally, sound planning and resource preservation practices dictate that park roads are laid lightly on the land and designed with extreme care. Where they exist, park roads are often narrow, winding, and hilly—but therein may lie their appeal.

Park roads are constructed only where necessary, and only as necessary, to provide access for the protection, use, and enjoyment of the natural, historical, cultural, scenic, and recreational resources, which constitute the national park system. Each road segment relates to the resource traversed in a meaningful way and constitutes an enjoyable and informative experience, while providing the visitor with inspiring views and driving comfort and safety. National park roads are designed to impart an overall sense of intimacy, while blending with the countryside through which they pass. Where terrain and safety conditions permit and where such uses are advocated by the park's approved general management plan, opportunities are also provided for random stopping to enable visitors to more completely experience park resources.

Park roads are not intended or designed as continuations of the state and federal high-speed highway network, nor are they designed or designated to serve as connecting links to those systems. As such, park roads cannot accommodate all types of vehicles nor can they accommodate all levels of speed. While the travel industry continues to develop new kinds of vehicles, the National Park Service is not obliged to construct roads or to manage traffic so that all forms of modern transportation technology can be accommodated. Recent transportation trends have significantly affected the use of National Park

Service roads. There have been substantial increases in the numbers of recreational vehicles, bicycles, tour buses, and smaller less powerful automobiles using park roads within the past few decades. The growth in popularity of recreational vehicles (which are characterized by greater dimensions, slower operation, and frequently, inexperienced drivers) is a relatively recent phenomenon. The recreational vehicle (to include tour buses) represents a significant element in the traffic service and road design requirements of park roads. Design of park roads should reflect, to the extent possible where such vehicles are permitted, the fact that recreational vehicles have very different operational and safety characteristics than automobiles.

The growth in the number of recreational vehicles and tour busses on park roads has serious safety implications resulting from large numbers of long, wide vehicles operating on relatively narrow roads. The resultant increase in the number of repeated heavy-axle loadings is also detrimental to the service life of road pavements that were not originally designed for continuous use of such large, heavy vehicles.

When the condition of park roads is examined, a determination of the size and types of vehicles that can be safely accommodated is calculated, and vehicle sizes and limits are sometimes established. In some instances, it is desirable for vehicles exceeding these limits to be restricted from a particular road or road segment, rather than reconstruct roads to higher standards. Such reconstruction may result in unacceptable consequences to park resources. Where vehicle restrictions are encouraged, appropriate alternatives include, but are not limited to: restricting vehicle traffic beyond specific points, providing turnarounds and parking areas for larger vehicles, reducing speed limits, and/or providing alternate transportation means.

Safeguarding visitor safety, providing quality recreation opportunities, and conducting sound planning and resource protection and management are primary National Park Service goals. It is with these principles in mind that National Park Service road standards have been developed, providing definitive guidelines for those involved in making decisions affecting traffic flow and circulation of park visitors.

PROJECT SCOPING

Scoping is an effort to involve agencies and the general public in determining issues to be addressed in this EA. Scoping is used to determine important issues to be given detailed analysis 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 EA 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 State Historic Preservation Office [SHPO], American Indian tribes, and the general public) to obtain early input.

Staff of Wupatki and the Federal Highway Administration conducted internal scoping beginning in April 2004. 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 Wupatki.

A press release initiating scoping and describing the proposed action was issued on May 31, 2005 (appendix A). No comments were received to date. The public and American Indian groups traditionally associated with the lands of Wupatki will also have an opportunity to review and comment on this EA.

The USFS manages portions of the land through which Route 10 crosses. Through an interagency agreement with the USFS, the National Park Service is responsible for maintaining the road. The staff of Wupatki have been in consultation with the USFS on the proposed road rehabilitation.

The National Historic Preservation Act, as amended (16 *United States Code* [USC] 470 *et seq.*), NEPA, National Park Service Organic Act, NPS *Management Policies* (2001), Director's Order – 12: *Conservation Planning, Environmental Impact Analysis, and Decision-making* (2001), and Director's Order – 28: *Cultural Resources Management Guideline* require the consideration of impacts on cultural resources, either listed in or eligible to be listed in, the National Register of Historic Places (NRHP). The National Park Service has contacted the Arizona SHPO and discussed the proposed rehabilitation of the road and parking areas, as well as the improvements in the visitor center area. This EA will be forwarded to the Arizona SHPO for review and comment.

ISSUES AND IMPACT TOPICS

Issues

Issues and concerns affecting this proposed action were identified from past National Park Service planning efforts and input from environmental groups and state and federal agencies. The major issues are the conformance of the proposed action with the *Final Environmental Impact Statement and General Management Plan, Wupatki National Monument* (2002a) (*General Management Plan*) and potential impacts to archeological resources, historic structures and districts, visitor use and experience, monument neighbors and other agencies, and monument operations.

Derivation of Impact Topics

Specific impact topics were developed for discussion and to allow comparison of the environmental consequences of each alternative. These impact topics were identified based on federal law, regulations, and executive orders; NPS *Management Policies* (2001); and National Park Service knowledge of limited or easily impacted resources. A brief rationale for the selection of each impact topic is given below, as well as a rationale for dismissing specific topics from further consideration.

Impact Topics Included in this Document

Archeological Resources

Numerous legislative acts, regulations, and National Park Service policies provide direction for the protection, preservation, and management of cultural resources, including archeological resources on public lands. Further, these laws and policies establish what must be considered in monument planning and how cultural resources must be managed in future undertakings resulting from the approved plan, regardless of the final alternative chosen.

Applicable laws and regulations include the National Park Service Organic Act (1916), the Antiquities Act of 1906, the National Historic Preservation Act of 1966 (2000, as amended), NEPA, the National Parks and Recreation Act of 1978, the Archeological Resources Protection Act of 1979, the Native

American Graves Protection and Repatriation Act of 1990, and the Curation of Federally Owned and Administered Archeological Collections (1991). Applicable agency policies relevant to cultural resources include chapter 5 of NPS *Management Policies* (2001), and Director's Order – 28: *Cultural Resource Management*, as well as other related policy directives such as the National Park Service *Museum Handbook*, National Park Service *Manual for Museums*, and *Interpretation and Visitor Services Guidelines* (NPS-26).

Both the no-action and preferred alternatives have the potential to affect archeological resources. Therefore, archeological resources will be addressed as an impact topic in the EA.

Historic Structures and Districts

The National Historic Preservation Act, as amended in 2000 (16 USC 470 *et seq.*), NEPA, National Park Service Organic Act, NPS *Management Policies* (2001), Director's Order – 12: *Conservation Planning, Environmental Impact Analysis, and Decision-making* (2001), and Director's Order – 28: *Cultural Resources Management Guideline* require the consideration of impacts on cultural resources, including historic structures, either listed in or eligible to be listed in the NRHP. The process and documentation required for preparation of this EA will be used to comply with section 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). This document will be submitted to the Arizona SHPO for review and comment.

The Wupatki Visitor Center Complex Historic District is an amalgam of National Park Service rustic style architecture buildings constructed by the CCC, and structures and buildings of National Park Service modern style architecture associated with the Mission 66 program. Through a consensus determination of eligibility with the National Park Service and Arizona SHPO, the Wupatki Visitor Center Complex Historic District has been determined to be nationally significant. The proposed action has the potential to affect features that contribute to the historic district. Therefore, historic structures and districts will be addressed as an impact topic in the EA.

Threatened and Endangered Species and Species of Concern

The Endangered Species Act (1973), as amended, requires an examination of impacts on all federally listed threatened or endangered species. National Park Service policy also requires examination of the impacts on federal candidate species, as well as state-listed threatened, endangered, candidate, rare, declining, and sensitive species.

In a letter dated August 25, 2004 (USFWS Reference No. AESO/SE 02-21-04-I-0396) (appendix B), the U.S. Fish and Wildlife Service provided a Web site link to a continually updated list of special-status species that are within Coconino County, where the project construction would occur. There are no federally listed threatened or endangered plant or animal species known to occur in the project area (NPS 2002a, NPS 2004). Should the preferred alternative be implemented, there would be no impacts to any listed species or designated critical or essential wildlife habitat.

Monument staff and the Arizona Heritage Database were consulted for a listing of species of concern not listed as threatened or endangered by the U.S. fish and Wildlife Service. The monument identified the pronghorn antelope (*Antilocapra Americana*) and the golden eagle (*Aquila chrysaetos*) as animal species of concern. The monument also identified five plant species of concern potentially occurring along the proposed construction route, including Simpson hedgehog cactus (*Pediocactus simpsonii*), Navajo pincushion cactus (*Pediocactus peeblesianus* var. *fickeiseniae*), sentry milkvetch (*Astragulus*

cremnophylax, var. *hevronii*), largeleaf springparsley (*Cymopterus megacephalus*), roundleaf dunebroom (*Errazurizia rotundata*), and Peeble's bluestar (*Amsonia peeblesii*). Based on a review of the Arizona Heritage Database, there could be eight listed plant species of concern, three listed mammal species of concern, and two listed bird species of concern.

Because the proposed project has the potential to impact these species of concern or their habitat, threatened and endangered species and species of concern will be addressed as an impact topic in the EA.

Visitor Use and Experience

Providing for visitor use and enjoyment is one of the elemental purposes of the National Park Service according to the 1916 Organic Act. The 2002 Wupatki *General Management Plan* established provisions for recreational uses by providing quality facilities for a more meaningful visitor experience. Alternatives in this document have the potential to impact visitor use and experience at Wupatki. Therefore, visitor use and experience will be addressed as an impact topic in the EA.

Monument Neighbors and Other Agencies

For the purpose of this EA, monument neighbors and other agencies are described as local residents, ranchers, sister agencies, and researchers who routinely use Route 10 for commuting and access. Wupatki is managed as part of a greater ecological, social, economic, and cultural system. Effects to monument neighbors and other agencies would be anticipated should the proposed alternative be selected. Because the road work has the potential to affect this group, monument neighbors and other agencies will be addressed as an impact topic in the EA.

Monument Operations

Monument operations associated with maintaining the roads and parking areas included as part of the proposed project could be affected variously by either of the alternatives described in this document. In addition, monument staff are needed to direct parking at the visitor center on busy days and to monitor the Citadel Pueblo parking area when temporary, easily removed, or bypassed barriers are placed to close the area to visitors. Under the preferred alternative, road maintenance work would be decreased and monument staff time spent directing traffic and monitoring closed areas would be reduced. Therefore, monument operations will be addressed as an impact topic in the EA.

Impact Topics Dismissed from Further Analysis

Geology and Geologic Hazards

Although ground-disturbing activities would occur under the preferred alternative, no blasting would be allowed. The *General Management Plan* states, "The potential impacts to surface geologic outcrops from road or facility construction. . . are deemed to have a negligible impact upon the geologic resources of the regional environment (NPS 2002a)." Nor would geologic hazards (e.g., faults and seismic activity such as earthquakes) be anticipated to affect the project. Therefore, geology and geologic hazards was dismissed from further analysis as an impact topic.

Soils

The proposed action could affect soils resources through the expansion of several parking areas and reduction or relocation of other parking areas. Under the preferred alternative, the road rehabilitation would occur within the existing road corridor and would not significantly disturb soils. Soils would be disturbed during parking area reduction and relocation through grading, compaction, and covering with pavement for new parking areas and through pavement removal, grading, and revegetation for parking area reduction areas. However, impacts to soils would be considered negligible and short term; therefore, soils was dismissed from further analysis as an impact topic.

Air Quality

The 1963 Clean Air Act provides that the federal land manager (the assistant secretary for fish and wildlife and parks and the monument superintendent) has an affirmative responsibility to protect the park's air quality-related values (including visibility, plants, animals, soils, water quality, cultural and historic resources and objects, and visitor health) from adverse air pollution impacts. Section 118 of the 1963 Clean Air Act requires the park 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. NPS *Management Policies* (2001) addresses the need to analyze potential impacts to air quality during park planning.

Wupatki is classified as a class II air quality area under the Clean Air Act, as amended. The Clean Air Act and National Park Service policies require that air quality in class II areas meet national ambient standards for specified pollutants, and that National Park Service activities do not deteriorate air quality.

Should the preferred alternative be selected, local air quality would be temporarily affected by dust and vehicle emissions generated during construction activities. 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 rapidly dissipated into the atmosphere.

Fugitive dust plumes from construction equipment would intermittently increase airborne particulates in the area near the project site, but loading rates would not be considerable. To mitigate these effects, such activity would be coupled with water sprinkling to reduce dust.

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. None of these identified air pollutant sources would generate sufficient quantities to warrant a discharge permit under U.S. Environmental Protection Agency and Arizona Department of Environmental Quality regulations. These effects would last only as long as construction occurred and the monument's class II air quality would not be affected by the proposal; impacts would be negligible and short term. Therefore, air quality was dismissed from further analysis as an impact topic.

Wildlife

NEPA is the basic national charter for protection of the environment. It requires federal agencies to use all practicable means to restore and enhance the quality of the human environment and to avoid or minimize any possible adverse effects of their actions on the environment. National Park Service policy is 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]). Under the preferred alternative, most of the road work would take place within the existing road corridor.

Some wildlife habitat would be disrupted by the roadway construction; however, most construction would occur within the road corridor, which does not support wildlife. The noise and human activity associated with the construction activities would have a negligible potential to affect wildlife and; therefore, wildlife communities was dismissed from further analysis as an impact topic.

Vegetation

NEPA is the basic national charter for protection of the environment. It requires federal agencies to use all practicable means to restore and enhance the quality of the human environment and to avoid or minimize any possible adverse effects of their actions on the environment. National Park Service policy is 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]). Under the preferred alternative, most of the road work would take place within the existing road corridor. Impacts to vegetation would include removal of existing species adjacent to the road corridor during construction activities and rehabilitation of the area adjacent to the road corridor and the 29 turnouts to be eliminated upon completion of the construction work. During rehabilitation of disturbed areas, there is a potential for nonnative vegetation to become established in these areas. However, rehabilitation efforts would include a monitoring period on completion of the work and allow for treatment to eliminate nonnative species. Over the long-term, there would be no impacts to vegetation. As a result, impacts to vegetation would be short-term, negligible to minor, and adverse; therefore, vegetation was dismissed from further analysis as an impact topic.

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 parks.

The project area is drained by intermittent streams that typically flow only in response to large precipitation events. There are no water bodies or perennial streams in the project area or within close proximity to the project area—the closest large drainage is the Little Colorado River, located more than 6 miles from the project area, and the Little Colorado River is an intermittent stream. In addition, best management practices for control of sediment and runoff would be used throughout the construction area to minimize the potential for impacts to intermittent drainages that the roadway crosses. With the great distance to any flowing water and implementation of best management practices, the potential for impacts to water quality is negligible; therefore, water quality is dismissed from further analysis as an impact topic.

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* (2001), Director's Order –2: *Planning Guidelines*, and Director's Order –12: *Conservation Planning, Environmental Impact Analysis, and Decision-making* provide guidelines for proposed actions in

floodplains. The road crosses the floodplains of four major intermittent drainage systems identified in the *General Management Plan*: Citadel Wash, Antelope Wash, Doney Mountain Wash, and Deadman Wash (NPS 2002a). Proposed road construction in these areas would not change the current footprint as the road passes through these washes. During construction, no short-term placement of fill would occur that would change the floodplain or constrict flows. Therefore, floodplains are dismissed from further analysis as an impact topic. This project, which consists of resurfacing and generally routine maintenance, would not modify the channel or adversely affect the natural resources or functions of the floodplain. Therefore, it is outside the scope and applicability of Procedural Manual 77-2 NPS, Floodplain Management, October 2002, and no floodplain statement of findings is required.

Wetlands

Executive Order 11990 (*Protection of Wetlands*) requires an examination of impacts to wetlands. The 2002 *General Management Plan* states that "Wetlands that meet the U.S. Fish and Wildlife Service jurisdictional criteria under section 404 of the Clean Water Act are likely only found on the bed of the intermittently flowing Little Colorado River. . . . Although extremely limited in area, Peshlaki Spring may also meet jurisdictional wetlands criteria (NPS 2002a)." Peshlaki Spring is located approximately 0.2 mile west of Route 10 and would not be affected by any project activities. The Little Colorado River is located more than 6 miles to the west of the proposed project activities. Therefore, wetlands are dismissed from further analysis as an impact topic.

Ethnographic Resources

The National Park Service defines ethnographic resources 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" (Director's Order – 28: *Cultural Resource Management Guideline*, p. 191).

Wupatki, in north-central Arizona, is part of a region lying between extensive high altitude national forest lands to the southwest and semi-desert mesas of the Hopi and Navajo Indian Reservations to the northeast. The latter forms the largest block of Indian tribal lands in the United States, including more than 25,000 square miles. These contemporary reservations are only a small portion of the customary lands occupied aboriginally and historically by the tribes, and to which the tribes retain deeply rooted traditional associations. The three Flagstaff area monuments are an integral part of this larger traditional landscape. Many of the geographic features and natural and cultural resources identified by the tribes as culturally significant within the three monuments are historically or ceremonially interconnected with other landscape elements, ethnographic features, and archeological sites throughout the tribes' entire customary land bases. In addition to the Hopi and Navajo Tribes, who concurrently occupy the tribal lands adjacent to or near the monuments, many of the other tribes originally consulted early in the general management plan planning process retain customary associations with many of the same resources and places throughout the region. A good literature-based review of tribal associations with the Flagstaff area monuments and surrounding region can be found in Brandt (1997).

Most of the archeological sites in the monument are considered traditional cultural properties and ethnographic resources. Ethnographic resources are known to exist in proximity to the project area, but the proposed action would not affect sites, structures, objects, landscapes, or natural resource features. Access to known ethnographic resources in the monument could be affected by road delays and parking area closures during construction. These potential impacts are considered under the "Monument

Neighbors and Other Agencies" topic. Therefore, ethnographic resources are dismissed from further analysis as an impact topic.

Cultural Landscapes

As described by the National Park Service *Cultural Resource Management Guideline* (Director's Order – 28), a cultural landscape is

> *". . .a reflection of human adaptation and use of natural resources and is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built. The character of a cultural landscape is defined both by physical materials, such as roads, buildings, walls, and vegetation, and by use reflecting cultural values and traditions."*

Cultural landscapes at Wupatki have not been formally identified. There are no known cultural landscape features identified in the immediate area of the Route 10 corridor that could be affected by current project actions; therefore, cultural landscapes is dismissed from further analysis as an impact topic.

Museum Objects

Museum collections include historic artifacts, natural specimens, and archival and manuscript material. They may be threatened by fire, vandalism, natural disasters, and careless acts. The preservation of museum collections is an ongoing process of preventive conservation, supplemented by conservation treatment when necessary. The primary goal is preservation of artifacts in as stable condition as possible to prevent damage and minimize deterioration. The proposed activities along Route 10 would not affect museum objects of Wupatki; therefore, museum objects are dismissed from further analysis as an impact topic.

Indian Trust Resources

Secretarial Order 3175 requires that any anticipated impacts to Indian trust resources from a proposed project or action by Department of the Interior agencies be explicitly addressed in environmental documents. The federal Indian trust responsibility is a legally enforceable fiduciary obligation on the part of the United Sates to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes. There are no Indian trust resources in Wupatki (NPS 2004). The lands comprising the monument are not held in trust by the Secretary of the Interior for the benefit of Indians due to their status as Indians. Therefore, Indian trust resources are dismissed from further analysis as an impact topic.

Prime and Unique Farmlands

In 1980, the Council on Environmental Quality directed federal agencies to assess the effects of their actions on farmland soils classified as prime or unique by the United States Department of Agriculture, Natural Resources Conservation Service. Prime or unique farmland is defined as soil, which particularly produces general crops such as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops such as fruits, vegetables, and nuts. According to the Natural Resources Conservation

Service, none of the soils in the monument are classified as prime or unique farmlands; therefore, prime and unique farmlands are dismissed from further analysis as an impact topic (NPS 2002a).

Designated Critical Habitat, Ecologically Critical Areas, Wild and Scenic Rivers, Other Unique Natural Areas

No areas within the project corridor are designated as critical habitat or ecologically critical, nor are there any existing or potential wild and scenic rivers within the project area (NPS 2004). Wupatki is an important natural area, but the proposed action would not threaten the associated qualities and resources that make the monument unique. The construction activities are confined to the area along the road corridor and would not impact the unique cultural and natural setting of the monument; therefore, this topic is dismissed from further analysis as an impact topic.

Health and Safety

Traffic safety and accident reduction are not defined as part of the need for the road rehabilitation project. Safety is considered in the design for the parking areas; however, the primary purpose of the proposed rehabilitation of the parking areas under the preferred alternative is to improve traffic flow patterns. Implementation of either alternative would not have an appreciable effect on health and safety; therefore, health and safety is dismissed from further analysis as an impact topic.

Environmental Justice

Executive Order 12898 (*General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations)*, requires all agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations or communities. No alternative under consideration would have disproportional health or environmental effects on minorities or low-income populations or communities as defined in the Environmental Protection Agency's *Environmental Justice Guidance* (1998). Environmental justice is, therefore, dismissed from further analysis as an impact topic.

Soundscapes

In accordance with NPS *Management Policies* (2001) and Director's Order – 47: *Sound Preservation and Noise Management*, an important part of the National Park Service mission is preservation of natural soundscapes associated with national park units. Natural soundscapes exist in the absence of human-caused sound. The natural ambient soundscape is the aggregate of all the natural sounds that occur in park units, together with the physical capacity for transmitting natural sounds. Natural sounds occur within and beyond the range of sounds that humans can perceive and can be transmitted through air, water, or solid materials. The frequency, magnitude, and duration of human-caused sound considered acceptable varies among National Park Service units, as well as potentially throughout each park unit, being generally greater in developed areas and less in undeveloped areas. Noise associated with road improvements would be short term and localized, and construction activities would be scheduled so as to minimize effects on monument neighbors and other agencies and visitors. Additionally, no work would be allowed on weekends or holidays, or at night unless authorized in writing by the superintendent. Road improvements would not result in measurable short- or long-term increases in traffic noise; therefore, soundscapes are dismissed from further analysis as an impact topic.

Lightscapes

In accordance with NPS *Management Policies* (2001), the National Park Service strives to preserve natural ambient lightscapes, which are natural resources and values that exist in the absence of human-caused light. All project work would occur during daylight hours so that human-caused light would not be increased at night, and no new lighting would be added to Route 10 or the parking areas. Lightscapes would not be affected by the proposed action; therefore, this topic is dismissed from further analysis as an impact topic.

Visual and Scenic Resources

Visual and scenic resources are the panoramic views of the natural and cultural environment of the monument and surrounding areas provided by the road corridor parking areas, trails, scenic overlooks, and other visitor use areas of the monument. In an evaluation of scenic quality, both the visual character and visual quality of a viewshed are considered. A viewshed comprises the limits of the visual environment associated with the proposed action. Visual resources would be affected by the proposed project; however, the effects would be short term, localized, and negligible. Visual impacts would occur during construction and to areas close to the construction. Over the long term, the scenic viewscapes of Wupatki would not be affected by the proposed project. Therefore, visual and scenic resources are dismissed from further analysis as an impact topic.

Land Use

Local land use in the area surrounding the monument consists of ranching and grazing, with scattered housing developments. Neither the no-action or preferred alternatives would change local or regional land use. Therefore, land use is dismissed from further analysis as an impact topic.

Socioeconomic Environment

Implementation of the preferred alternative could provide a negligible beneficial impact to the economy of Flagstaff (e.g., increased employment opportunities for the construction work force and revenues for local businesses and government related to construction activity). The duration of construction activity for the preferred alternative is 9 months to 1 year. Benefits to the local economy would be temporary, lasting only during construction, and negligible overall. Therefore, socioeconomics are dismissed from further analysis as an impact topic.

ALTERNATIVES

INTRODUCTION

This section describes two management alternatives for the rehabilitation of Route 10 at Wupatki. Alternatives for this project were developed to resolve visitor experience and monument operations issues. The alternatives would resolve pertinent traffic safety, resource protection, visitor use, and other monument management issues.

The no-action alternative describes the action of continuing the present management operations, conditions, policies, and uses. The no-action alternative provides a basis for comparing the management direction and environmental consequences of the preferred alternative. Should the no-action alternative be selected, the National Park Service would respond to future needs and conditions associated with Route 10 at Wupatki without major changes in management policies or actions.

The preferred alternative presents the National Park Service proposed action and defines the rationale for the action in terms of resource protection and management, visitor and operational use, costs, and other applicable factors. All actions described in the preferred alternative would be conducted in accordance with the Wupatki *General Management Plan* (NPS 2002a).

Additional alternatives considered and dismissed from detailed analysis are also discussed in this section. An alternatives comparison table and a summary table comparing the environmental consequences of each alternative is presented at the end of the "Alternatives" section.

ALTERNATIVE A: NO-ACTION ALTERNATIVE

The no-action alternative would be the continuation of existing conditions and practices. The no-action alternative would leave Route 10 and associated parking areas as they are today. Deficiencies include deteriorating pavement and road surfaces on roadways, picnic area parking lots, turnouts, and the Wupatki Visitor Center parking area.

The no-action alternative does not preclude short-term, minor activities (e.g., limited safety and drainage improvements or normal highway maintenance activities) that would be part of routine maintenance for continuing operations of the existing roadway. Therefore, current maintenance operations would continue, including routine road repair, as it is within the capabilities of monument maintenance staff to perform. Although routine patching, applying chip seal, ditch clearing, striping, and signing activities would continue, the overall condition of the road and associated parking areas would not be improved and physical deterioration would continue.

Should the no-action alternative be selected, Wupatki staff would respond to future needs and conditions associated with the roadway without major actions or changes from the present course.

ALTERNATIVE B: PREFERRED ALTERNATIVE

Alternative B is the National Park Service preferred alternative. The preferred alternative presents the National Park Service's proposed action and defines the rationale for the action in terms of resource protection and management, visitor and operational use, and costs. The preferred alternative meets Wupatki's planning objective of maintaining the existing traffic route through the monument, while preserving monument resources (NPS 2002a).

Overview

The general road rehabilitation work for the 16-mile section of Route 10 would include resurfacing the roadway within the existing road corridor. No realignment of the road would occur; however, minor horizontal alignment shifts could occur. The road surface would be rehabilitated by pulverizing the existing asphalt. The pulverized material would be compacted in place and then covered with asphalt concrete pavement. Prior to pulverizing, the shoulder material would be pushed from the edge of the roadway to allow room for pulverizing. Following placement of the pavement, the existing shoulder material would be regraded, with the addition of new material, as necessary, to blend with the new pavement edge. The 5-mile overlay portion of the project would consist of placement of a 2-inch layer of asphalt concrete pavement over the existing asphalt. The road work would also include rehabilitation of certain parking areas, elimination of other turnouts, and repair work to portions of the previously rehabilitated sections of Route 10 through Sunset Crater. The following discussion provides details for specific road sections, parking areas, and turnouts.

Citadel Pueblo

The Citadel Pueblo parking area footprint would remain the same. A curbed island with native vegetation would be constructed between the roadway and parking area, creating two entrances—one at either end of the Citadel Pueblo parking area (figure 2). The existing parking area pavement would be pulverized and covered with a new layer of asphalt. These proposed improvements to the Citadel Pueblo parking area are shown on figure 3.

Permanent gates would be installed at each entrance to allow the parking area to be closed, consistent with the Wupatki *General Management Plan*, to protect natural and cultural resources. The gates would have stops to prevent them from swinging into traffic. Signs would be installed by the monument at a later date that would inform monument visitors of seasonal closures of the parking area.

Antelope Wash and Deadman Wash

The existing roadway at both Antelope Wash and Deadman Wash contains a sweeping curve and a dip. Rather than making changes to the road alignment that would disturb the existing

FIGURE 2. CITADEL PUEBLO PARKING AREA SHOWING WHERE CURBED ISLAND WOULD BE CREATED TO SEPARATE AREA FROM ROADWAY

road corridor, additional warning signs would be added to alert motorists of the upcoming road conditions. A centerline rumble strip would be added, the road shoulder would be

widened up to 12 inches, and a wider 8-inch shoulder stripe would be added. The road alignment would remain the same at both locations.

Wupatki Visitor Center

The Wupatki Visitor Center parking area currently has parking space for seven buses and 40 cars in a one-way circular loop. The tour buses must drive through the first parking area and around a loop to the second parking area and do not have a dedicated place to stop for passengers to enter and exit the bus. Typically, they stop in the loop at the closest point to the visitor center to allow passengers to enter or leave the bus (figure 4). When this happens, the buses block other traffic in the loop. In addition, the circular loop is narrow and buses, recreational vehicles, and cars with trailers do not have adequate room to maneuver through the parking area. On busy days, the parking area is congested, requiring monument staff to direct buses to park at the Pithouse parking area, approximately 1 mile from the visitor center.

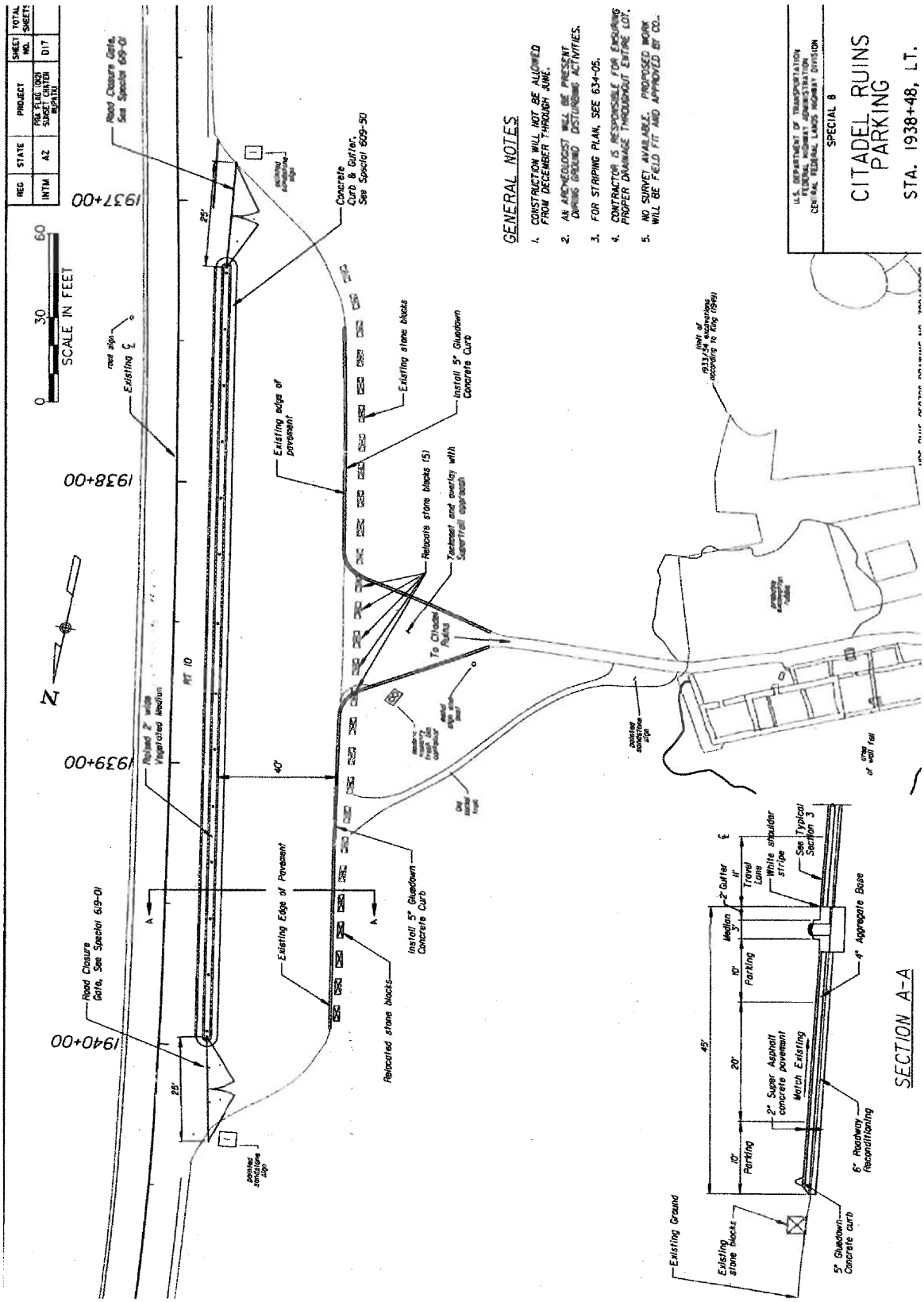

FIGURE 3. PROPOSED CHANGES TO CITADEL PUEBLO PARKING AREA [NPS-DSC 322/20022]

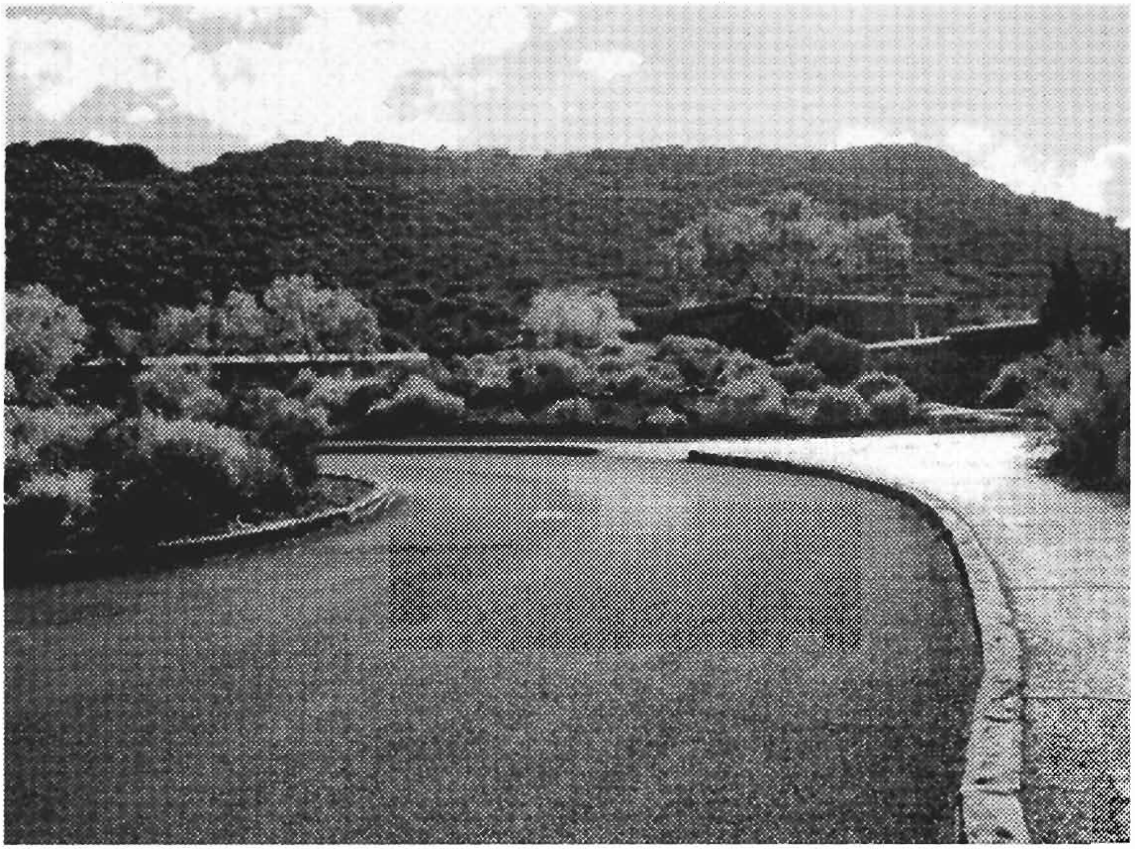

FIGURE 4. WUPATKI VISITOR CENTER APPROACH

The proposed rehabilitation of the Wupatki Visitor Center parking area would increase the width of the west turnaround to better accommodate bus movement. Tour bus parking would be expanded and a 6-foot-wide sidewalk would be added to the south perimeter for passengers to disembark from the buses without walking into vehicle traffic lanes. Tour buses would be instructed to unload passengers at the parking area rather than in the turnaround. Wheelchair-accessible parking would be created at the first turn-in area, prior to the turnaround on the northwest corner, which would allow visitors with disabilities to park adjacent to the visitor center.

Where the parking area and turnaround are being realigned, the existing stone face curb would be reused as much as possible. Where new curbing is needed, a stone curb and concrete gutter would be selected to closely match the color and texture of the existing stone curbing. The existing asphalt sidewalks leading to the visitor center would be replaced with concrete sidewalks. A small existing picnic area and access walk would be paved. Landscaping, a fountain, and benches would be installed along the approach to the visitor center. A curb cut and riprap for drainage improvement would be installed at the southeast corner of the lot. The residence section above the parking area would also be improved (repaved and new curbing installed). Figure 5 shows the improvements to the Wupatki Visitor Center parking area.

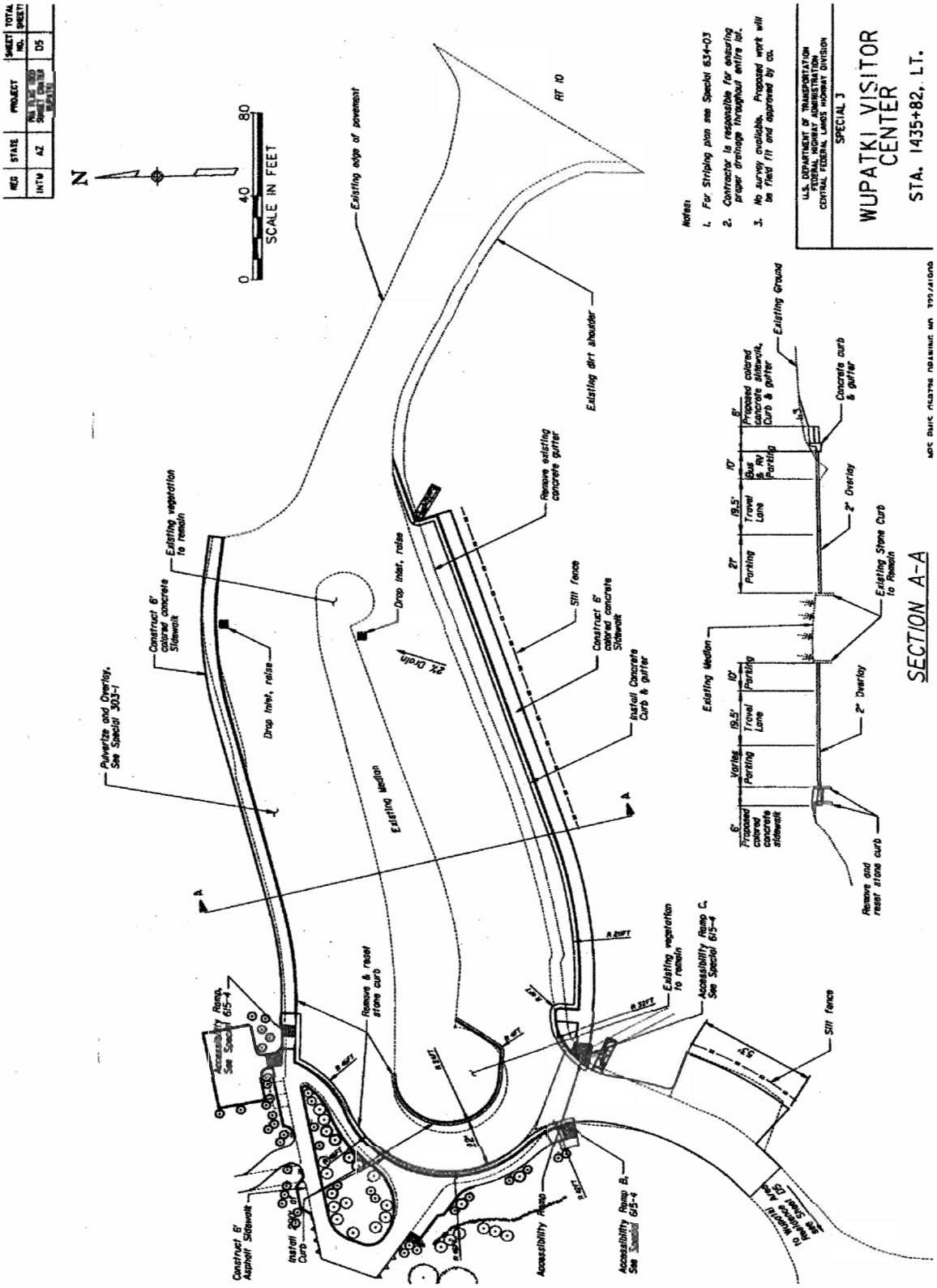

FIGURE 5. IMPROVEMENTS TO WUPATKI VISITOR CENTER PARKING AREA [NPS-DSC 322/20023]

A small dirt parking area to the west of the main visitor parking area (figure 6) would be paved to provide overflow parking and would not have curbs and gutters. An access road to the maintenance and housing areas south of the visitor center runs through the overflow parking area. This access road would receive a 2-inch overlay for its entire length.

Doney Wash Turnout

The Doney Wash turnout would be eliminated, drainage patterns re-established, and the existing gravel turnout would be rehabilitated (figure 7). The Doney Wash turnout is being eliminated due to safety concerns with vehicles turning onto and off the roadway at this spot, and to provide protection for wildlife in the vicinity.

Doney Crater Picnic Area

Figure 8 shows the proposed improvements for the Doney Crater picnic area. The Doney Crater picnic area would be repaved (figure 9). The utility poles currently being used as barriers to cars leaving the paved surface would be replaced with colored concrete and gutter. A concrete sidewalk would be added to the east side, and curb and gutter (also colored) would be used along the outer edge of the parking spaces. A new path to the restroom facilities would be installed and the existing path would be improved. Near the new path, the existing travel way would be widened by 10 feet to accommodate a wheelchair-accessible parking space. A new parking space for a bus/recreational vehicle would be added to the north side of the parking area. New wayside exhibits would be installed at a later date under another project. Figure 9 shows the proposed

Pithouse Turnout

The Pithouse turnout (figure 10) would be redesigned to reduce the size of the parking area, which is not being used to capacity. The parking area would be reduced in width by removing the curbing on the southwest side, moving the parking spaces to the northeast, and reclaiming the vegetated berm and the portion that would no longer be used as a parking area (figure 11). The existing native vegetation berm separating the parking area from the road would be left in place and undisturbed as much as practicable.

Wupatki Basin / Painted Desert Overview Turnout

The existing gravel turnout at the Painted Desert Overview would be eliminated. The existing turnout is on a curve and is not well defined, which creates a potential safety hazard with visitors trying to locate the turnout. A new turnout (100 feet in length by 16 feet wide) would be constructed on a straighter section of roadway approximately 200 feet to the north. The new turnout would have a raised curb to define the area and would have either interpretive exhibits (established under a separate project) or a wayside sign installed (figure 12). If interpretive exhibits are installed, the parking area footprint would be expanded to accommodate the exhibits and a greater number of parking spaces.

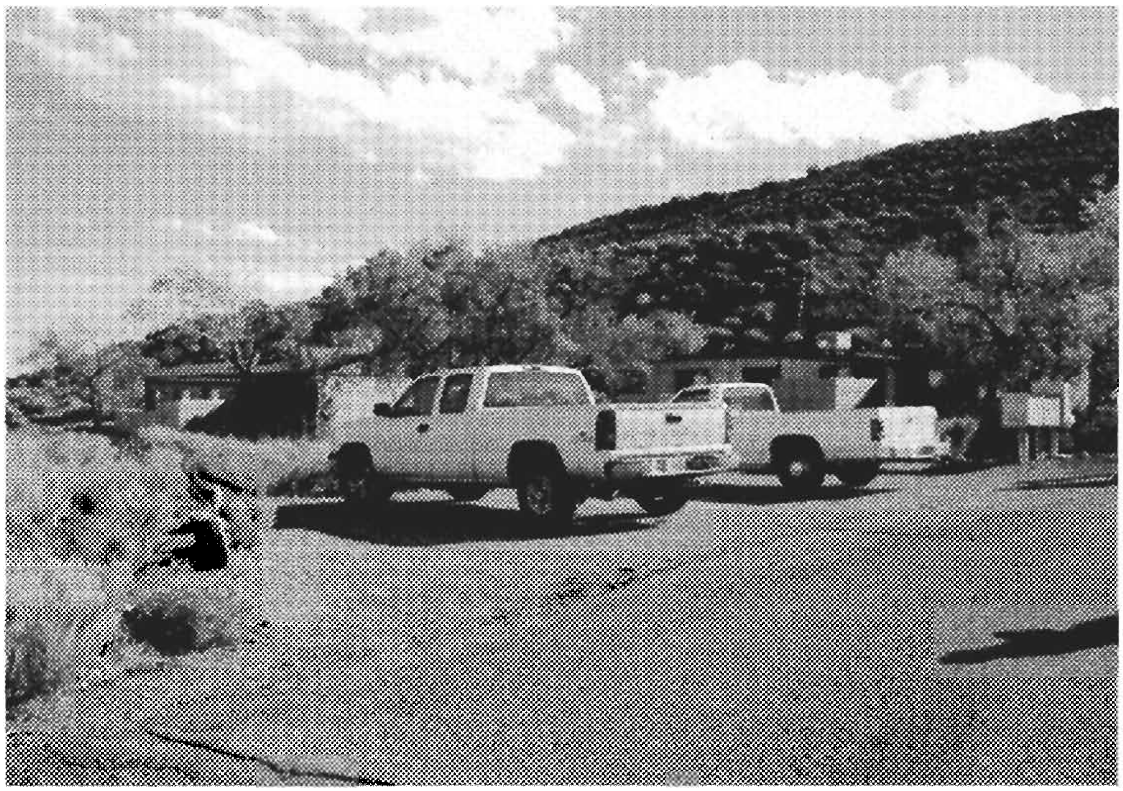

FIGURE 6. OVERFLOW PARKING AREA TO BE PAVED

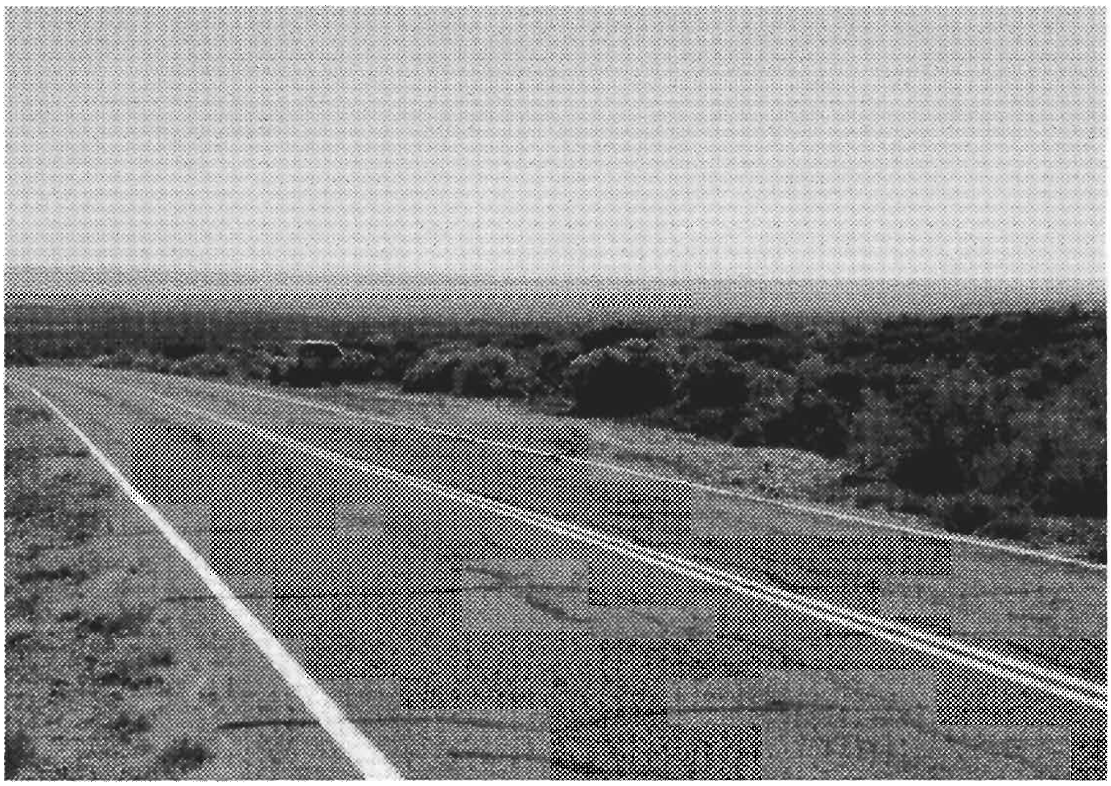

FIGURE 7. DONEY WASH TURNOUT REHABILITATION AREA

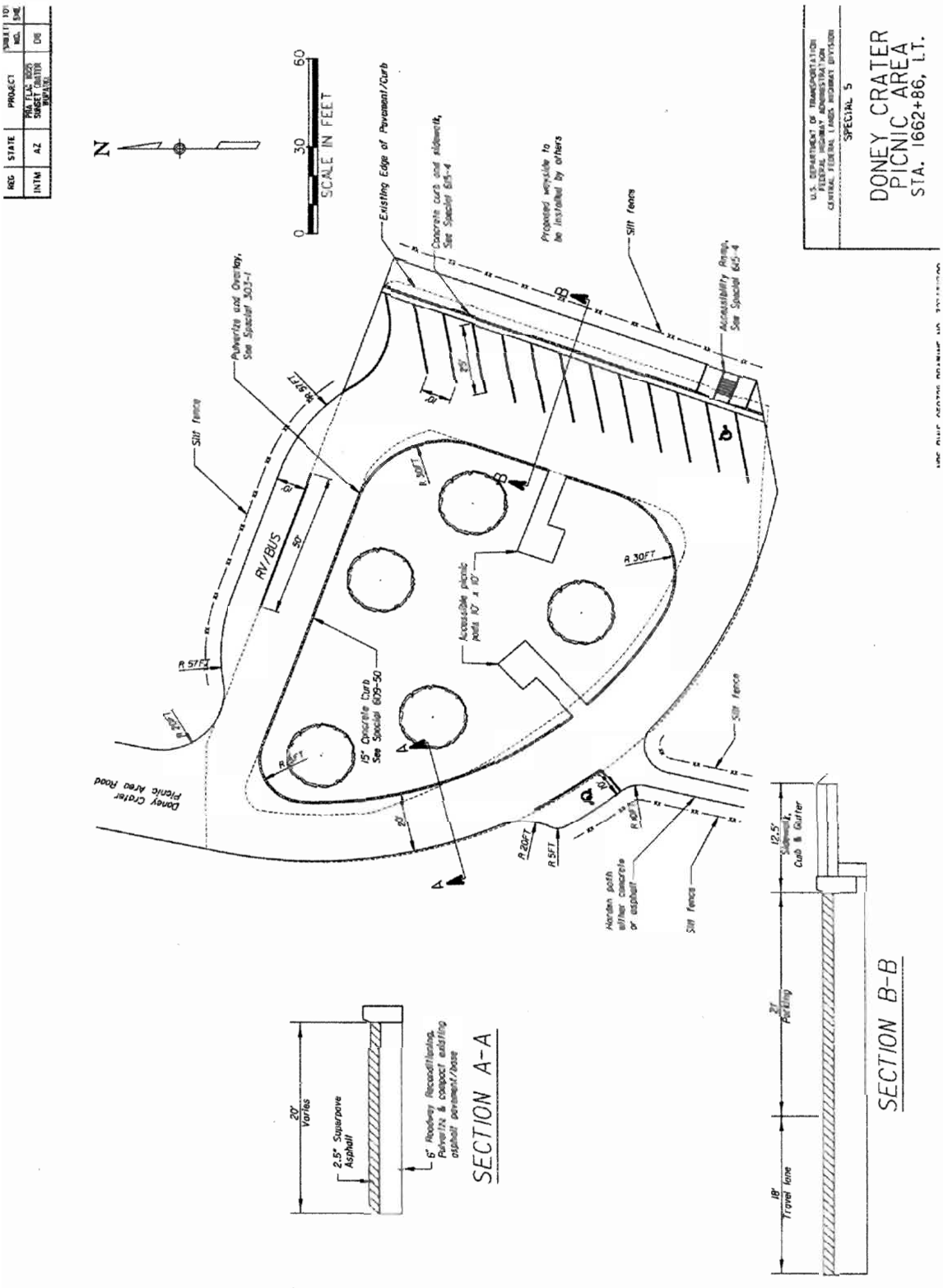

FIGURE 8. PROPOSED PLANS FOR NEW DONEY CRATER PICNIC AREA [NPS-DSC 322/20024]

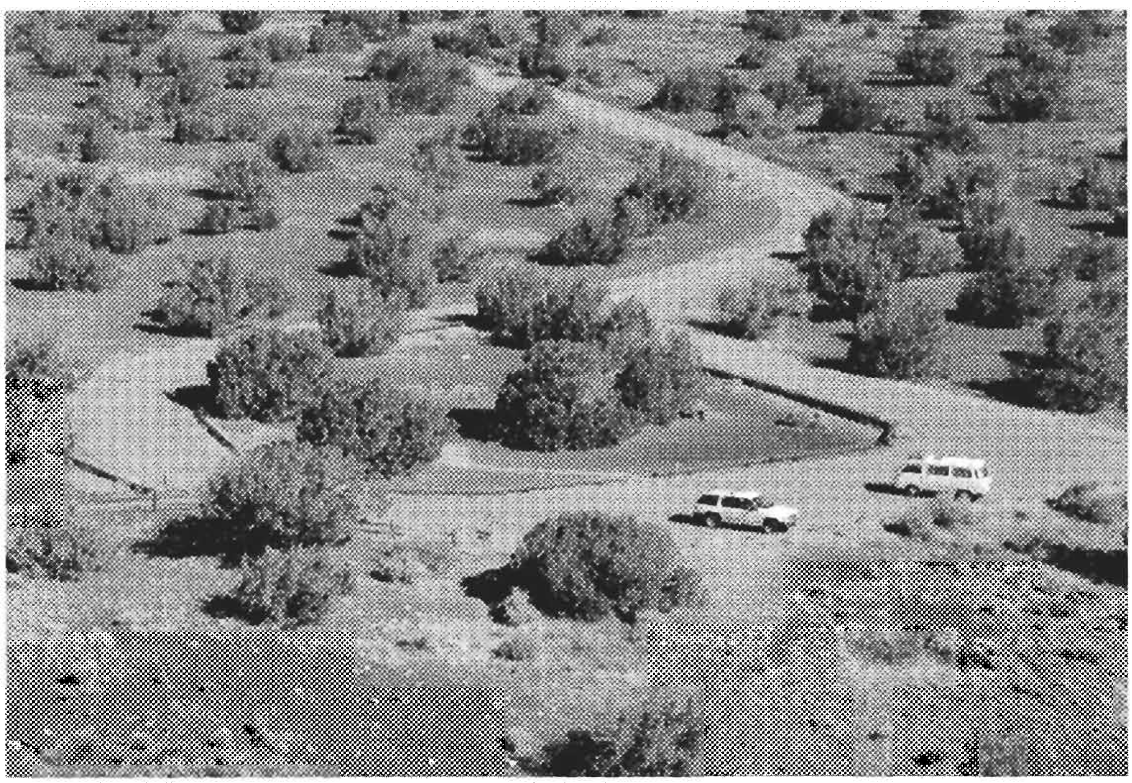

FIGURE 9. DONEY CRATER PICNIC AREA

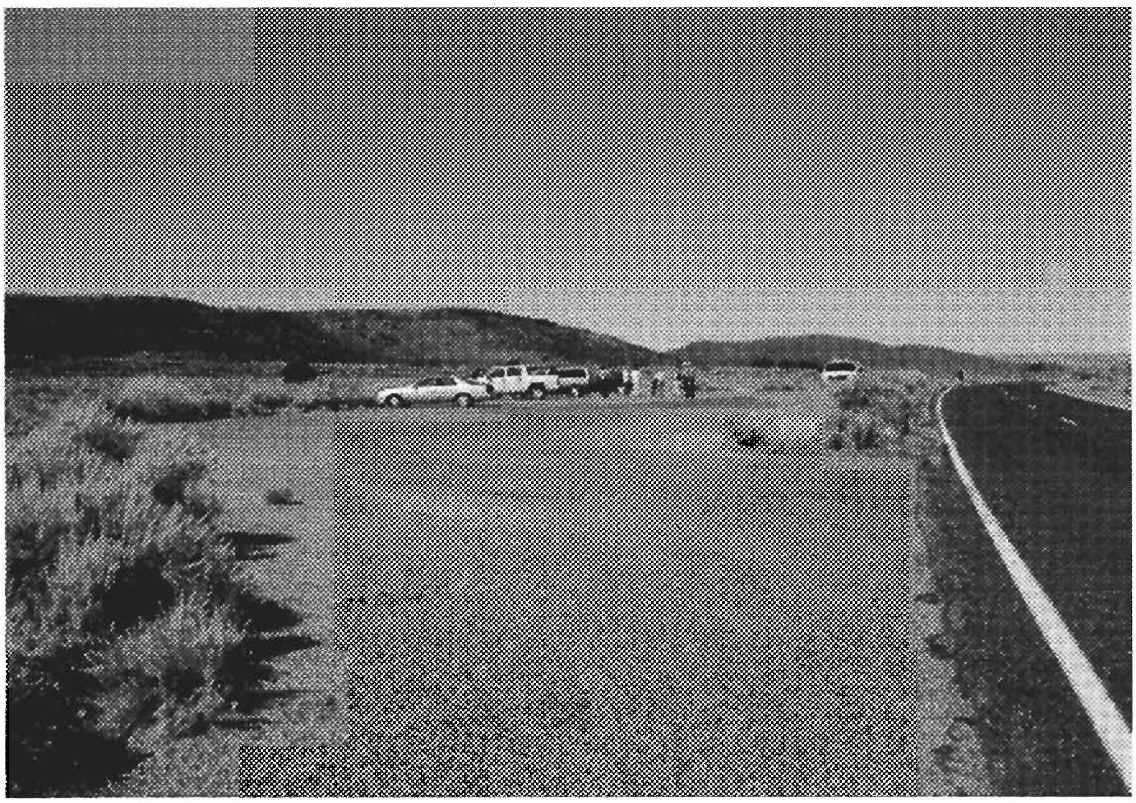

FIGURE 10. PITHOUSE TURNOUT

FIGURE 11. DRAWING OF ROADSIDE BERM AT PITHOUSE TURNOUT [NPS-DSC 322/20025]

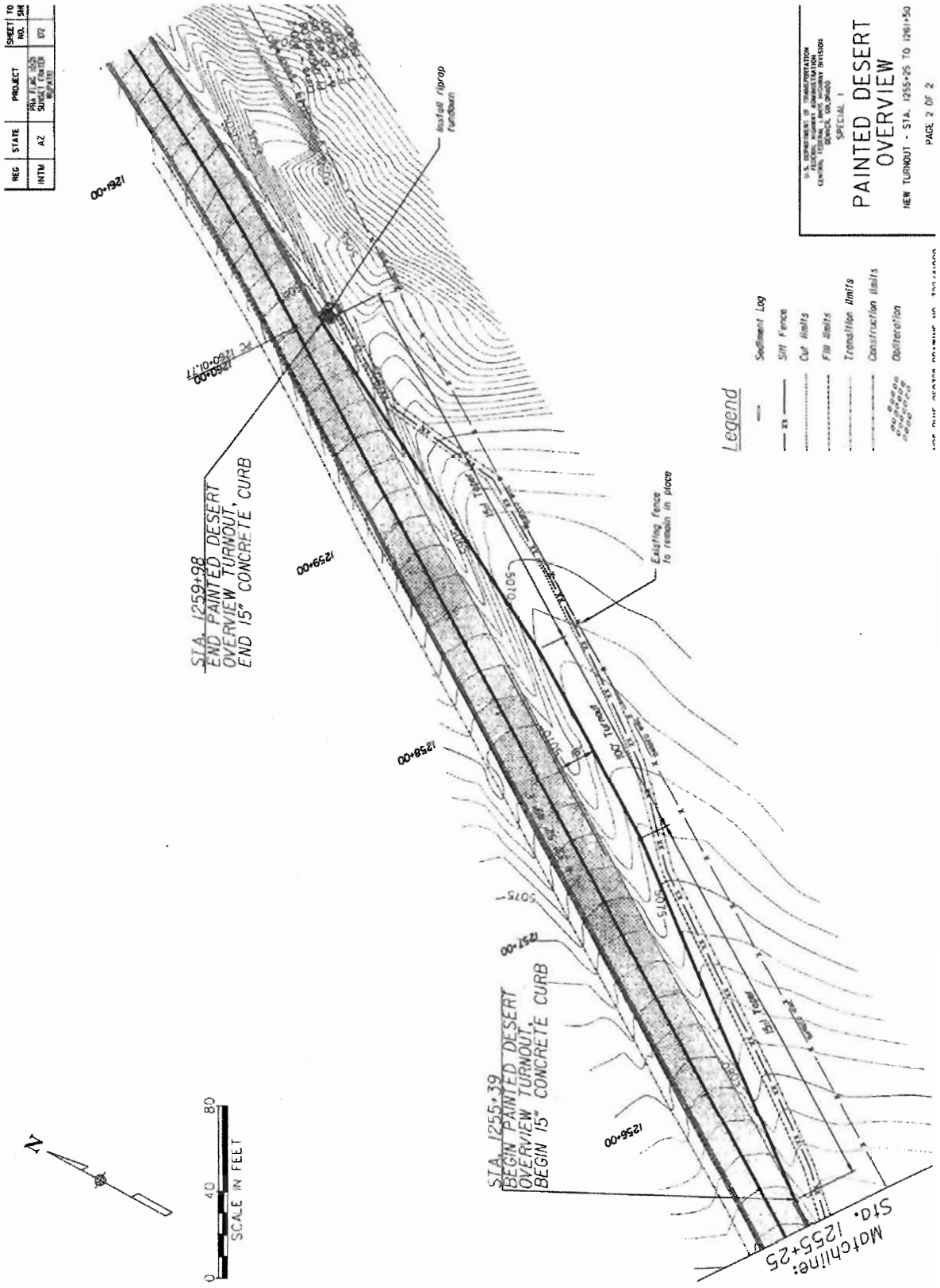

FIGURE 12. DRAWING OF NEW PAINTED DESERT OVERVIEW TURNOUT [NPS-DSC 322/20026]

Turnouts

In summary, four turnouts described above would be rehabilitated (Citadel Pueblo parking area, Doney Crater picnic area, Pithouse turnout, and the Wupatki Basin / Painted Desert Overview turnout. Three other turnout areas would be rehabilitated by resurfacing without changing the layout, including the Wupatki National Monument entrance turnout (near the northern intersection of Route 10 with U.S. 89), Wupatki Pueblo turnout, and the turnout for Strawberry Crater.

During internal scoping, approximately 40 turnouts along the road corridor were evaluated for elimination. Twenty-nine existing small gravel turnouts along the road would be eliminated, including the existing Wupatki Basin / Painted Desert Overview turnout and the Doney Wash turnout. These small gravel turnouts are located along the roadway and all turnouts but those specifically listed above as being rehabilitated would be eliminated and the areas reclaimed in accordance with the National Park Service revegetation plan. Appendix C contains the approximate milepost location for each turnout to be eliminated using mileage from the south intersection of Route 10 with U.S. 89.

Repairs to Previously Rehabilitated Road Sections

A number of repairs would occur to the previously rehabilitated portions of Route 10. This approximate 14-mile road section was completed in 2003, but several problem areas have been noted requiring repair in order to extend the life of the road. Within the first 2 miles, beginning at the south junction of U.S. 89, up to 1 mile of shoulders would be replaced, as needed. The existing road shoulder, consisting of poorly compacted cinder material, would be removed and replaced with compacted aggregate. No disturbance would occur beyond the existing shoulders.

Approximately six areas of the previously rehabilitated road section would require additional road work within the existing corridor and shoulders to repair drainage problems and weakened base and subbase as a result of the poor drainage. The work would consist of an approximate 8-foot by 8-foot by 3-foot-deep subexcavation to replace and compact subbase and base materials and establish drainage controls. Drainage controls would include ditching and curb cuts to convey water away from problem areas.

A section of previously rehabilitated road approximately 1.8 miles northwest of the Painted Desert picnic area is experiencing subgrade failure and drainage problems as a result of snow melt. A paved ditch and riprap protection would be installed to preserve the subbase and road surface.

There would also be drainage improvements 0.66 mile north of Sunset Crater Visitor Center that involve curb cuts and installation of riprap and sediment logs.

Other Considerations

Construction work would occur during the spring, summer, and fall seasons when visitor traffic is at the highest level. One lane of traffic would be open at all times. Delays would be kept to a maximum of 15 minutes, Monday through Friday from 7:30 a.m. to 9:00 a.m. and from 4:30 p.m. to 6:00 p.m., and a maximum of 30 minutes at other times. No holiday, night time, or weekend work would be permitted unless specifically authorized by the superintendent.

Road base and asphalt materials would be brought from approved sources outside the monument, as needed.

General Construction Schedule and Cost

The road rehabilitation work would be expected to take approximately one construction season from spring to fall, starting in 2006; however, construction could be delayed by availability of funding, weather conditions, or other unexpected events. The cost of the project is estimated at $5.8 million.

Staging Area

All staging for construction and equipment would occur in previously disturbed areas. Construction equipment and supplies would be staged along the roadway, in designated turnouts, and at the New Heiser maintenance area.

MITIGATION MEASURES OF THE PREFERRED ALTERNATIVE

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

Resource Area	Mitigation
General Considerations	All work areas would be clearly defined, and all activities would be confined within these zones.
	All resource protection measures would be clearly stated in the project specifications and workers would be instructed to avoid conducting activities outside of the defined project zones. In addition, the National Park Service would ensure that all contractors and subcontractors are advised that damage to resources outside the scope of work is subject to citation, fine, restoration expenses, and other penalties.
	No earthen or fill material would be borrowed or excavated from within the boundaries of Wupatki or Sunset Crater. Material generated during the roadway rehabilitation would be used as fill to the extent possible. Other necessary fill materials would be obtained from outside the monument. Contracting requirements would require the use of fill material that is certified free of weeds and archeological artifacts.
	Water sprinkling would be used, as needed, to mitigate intermittent fugitive dust and airborne particulate matter.
	Excess material generated from the road work would be disposed outside the monument, except for existing stone curbing. If existing stone curbing is not re-used, this material would be saved and stored within the monument at the New Heiser maintenance area for later use.

Resource Area	Mitigation
General Considerations	Best management practices for drainage and sediment control would be implemented to prevent or reduce nonpoint source pollution and minimize soil loss and sedimentation in drainage areas.
	Storing of hazardous materials and fueling of all machinery would only be conducted in monument-approved equipment staging areas. Any spills of hazardous materials, fuel, etc., would be immediately reported to the Wupatki hazardous materials coordinator and safety officer. Contingency plans for safely dealing with hazardous material spills would be submitted prior to project initiation. Spilled hazardous materials would be cleaned up immediately and would not be allowed to seep into the soil. Materials used for cleaning fuel spills and other hazardous materials would be available onsite.
	The National Park Service and its contractors would follow established policy requiring the use of energy-efficient and environmentally friendly products in the design and construction processes whenever possible.
	To minimize the potential for petrochemical leaks, equipment would be maintained in a clean and well-functioning state to avoid or minimize contamination from automotive fluids; all equipment would be checked frequently.
Cultural Resources	Any potential disturbance would be limited to 5 feet from the road edge or previously disturbed area and 3 feet in sensitive resource zones. For sensitive resource zones, surface collection of any artifacts would occur prior to any work in those areas.
	An archeological monitor would be present during any ground-disturbing activities, except during the overlay or for the pulverization work since that work would take place within the existing roadway limits.
	Should construction unearth previously undiscovered archeological resources, work would be stopped in the area of discovery and the monument would consult with the Arizona SHPO, affiliated American Indian tribes, and the Advisory Council on Historic Preservation, as necessary, according to 36 CFR 800.13 and, as appropriate, provisions of the Native American Graves Protection and Repatriation Act of 1990.
	The National Park Service would ensure that all contractors and subcontractors are informed of the penalties for illegally collecting artifacts or intentionally damaging archeological sites or historic properties. Contractors and subcontractors would also be instructed on procedures to follow in case previously unknown archeological resources are uncovered during construction.
	Equipment and materials staging areas would be located to avoid known archeological resources.
	Modifications to the visitor center parking area would be designed to blend with the surrounding landscape to the extent possible.
Species of Concern	Work in the Citadel Pueblo parking area would not occur during the golden eagle breeding season (December through June) if nesting golden eagles are present.
	Additional surveys for rare plants would occur prior to the beginning of road work so that protection or salvage measures can be implemented.
Visitor Use and Experience / Monument Neighbors and Other Agencies	It is expected that one lane of traffic would remain open for most of the road work. Access would be provided immediately for emergency vehicles. Maximum delays due to construction would be limited to 15 minutes Monday to Friday from 7:30 a.m. to 9:00 a.m. and from 4:30 p.m. to 6:00 p.m., and a maximum of 30 minutes any other time. No night time or holiday work would be allowed without authorization from the superintendent.

Resource Area	Mitigation
Visitor Use and Experience / Monument Neighbors and Other Agencies	Monument neighbors would be kept informed of the work schedule to the extent possible through mailings, signage, and/or other means designed to reach those that use the road for commuting.
	Rehabilitation of the visitor center parking area would be scheduled to allow continued use of portions of the parking area while the construction work is ongoing to avoid full closure of the parking area.

Sustainability

The National Park Service has adopted the concept of sustainable design as a guiding principle of facility planning and development. The objectives of sustainability are to design National Park Service facilities to:

- minimize adverse effects on natural and cultural values
- reflect their environmental setting
- maintain and encourage biodiversity
- construct and retrofit facilities using energy-efficient materials and building techniques
- operate and maintain facilities to promote their sustainability
- 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 preferred alternative subscribes to and supports the practice of sustainable planning, design, and use of Route 10 and associated parking areas and turnouts.

ENVIRONMENTALLY PREFERRED ALTERNATIVE

In accordance with Director's Order 12, the National Park Service 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, which is guided by the Council on Environmental Quality. The Council on Environmental Quality provides direction that "[t]he environmentally preferred alternative is the alternative that will promote the national environmental policy as expressed in section 101 of NEPA, which considers:

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

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

- improve maneuverability and improve safety of parking areas (criteria 2 and 5)
- allow for improved natural and cultural resource protection of the Citadel Pueblo area (criteria 1, 3, and 4)
- extend the life of pavement sections, eliminating the need for continuous repairs using valuable resources (criteria 1 and 6)
- enhance visitor experience by moving the Painted Desert turnout to a more appropriate viewing location (criteria 2, 4, and 5)

The environmentally preferred alternative in this EA is the National Park Service preferred alternative. This alternative was selected because it would meet the designations of the list outlined above by:

- enhancing visitor experience by completing improvements to the Doney Crater picnic area, the Wupatki Visitor Center, the Citadel Pueblo, and by moving the Painted Desert turnout to a more appropriate viewing location (criteria 2, 3, 4, and 5)
- improving the maneuverability and improving the safety of parking areas—designating unloading areas for buses (criteria 2 and 5)
- extending the life of pavement sections and eliminating the need for continuous repairs using valuable resources (criteria 1 and 6)

In short, this alternative would enhance the quality of use of the road for the visitor, monument neighbors, and other agencies; preserve and protect valuable natural and cultural resources; and improve day-to-day operations through minimal disturbance to natural and cultural resources.

ALTERNATIVES CONSIDERED BUT DISMISSED

Several alternatives for portions of the road were considered and eliminated. The National Park Service considered straightening curves and smoothing the road at Deadman Wash and Antelope Wash. The road construction would have resulted in disturbance outside of the current road corridor, including areas of cut and fill, to complete the road straightening and change the curvature. Such disturbance has the potential to impact known and possibly unknown archeological resources and was dismissed from consideration.

The National Park Service evaluated expanding the parking area at Citadel Pueblo, but decided to maintain the current parking area footprint to minimize potential impacts to archeological resources.

The National Park Service evaluated several options for expansion and changes to the Wupatki Visitor Center parking area. Some of the changes would have resulted in changes to the setting of the parking area and were dismissed. In addition, expansions of the parking area was redesigned to minimize potential impacts to known cultural resources.

ALTERNATIVES COMPARISON TABLE

No-Action Alternative	Preferred Alternative
The no-action alternative would continue the existing conditions for Route 10 and associated parking areas. Should the no-action alternative be selected, the National Park Service would respond to future needs and conditions associated with Route 10 and the associated parking areas in Wupatki without major actions or changes in the present course. The no-action alternative does not preclude short-term minor repair or improvement activities for the road that would be a part of routine maintenance for continuing operation of the road.	The preferred alternative would rehabilitate 16 miles of Route 10, beginning at the south boundary of Wupatki and ending at the northern junction with U.S. 89. The construction would include placement of a 2-inch overlay for an additional 5 miles of Route 10 between Sunset Crater and Wupatki, if funding is available, and repair of several sections of previously completed road work in Sunset Crater that are experiencing raveling edges and drainage problems. Parking areas and turnouts would also be rehabilitated as part of the proposed project, including the Citadel Pueblo parking area, the Wupatki Visitor Center parking area, the Doney Crater picnic area, the Pithouse turnout, and the Painted Desert turnout. Two miles of previously completed road work would have poorly compacted cinder shoulders replaced.
Meets project objectives? **No.** Road conditions would continue to deteriorate, impacting visitors, monument neighbors, and other agencies that use Route 10. Previously rehabilitated road segments requiring further repair would not be rehabilitated and the life of these segments would be decreased. Monument visitors would not have adequate parking or loading and unloading areas for buses. Archeological resources adjacent to the road could be subject to impacts due to road edge raveling. The requirement of the *General Management Plan* that Citadel Pueblo be gated to allow closure would continue to not be met.	Meets project objectives? **Yes.** The preferred alternative would improve the conditions of Route 10 and eliminate the potential for the deteriorating road to impact visitor experience and nearby archeological resources. The improvements to the Citadel Pueblo parking area would allow gated closure in accordance with the Wupatki *General Management Plan.* The parking area improvements would help with visitor experience and safety by increasing the number of parking spaces at some locations, improving vehicle maneuverability, and allowing for loading and unloading of bus passengers without the risk of accidents or obstruction of traffic. The 2-inch overlay and repair of previously rehabilitated road sections would end further deterioration and extend the life of these sections. Improvements to drainage and road shoulders on previously rehabilitated road segments would extend the life of those segments.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES / IMPACT COMPARISON MATRIX

Potential Environmental Impacts		
Impact Topic	**Alternative A: No Action**	**Alternative B: Preferred Alternative**
Archeological Resources	Impacts to archeological resources from the no-action alternative would be long term, minor, and adverse. After applying the Advisory Council on Historic Preservation's criteria of adverse effect (36 CFR 800.5), the National Park Service determined that the activities proposed in the no-action alternative would have an *adverse effect* to archeological resources.	Since construction would occur only in areas that have been disturbed by past activities and mitigation, including monitoring and artifact collection, would be implemented, the potential for adversely affecting intact archeological resources is minor. After applying Advisory Council on Historic Preservation criteria of adverse effect (36 CFR 800.5), the National Park Service determined that the activities proposed in the preferred alternative would have *no adverse effect* to archeological resources.
Historic Structures and Districts	No action would be taken in this alternative and; therefore, there would be no impact to historic structures and districts. After applying the Advisory Council on Historic Preservation's criteria of adverse effect (36 CFR 800.5), the National Park Service determined that the no-action alternative would have *no adverse effect* to historic structures and the district.	The preferred alternative would result in a long-term, minor, adverse impact to historic structures and districts. After applying the Advisory Council on Historic Preservation's criteria of adverse effect (36 CFR 800.5), the National Park Service determined that the activities proposed in the preferred alternative would have *no adverse effect* to historic structures and districts, specifically the Wupatki Visitor Center Complex Historic District.
Threatened and Endangered Species and Species of Concern	There are no known threatened or endangered species within the project area. The impacts to species of concern from the no-action alternative would be long term, negligible to minor, and adverse.	There are no known threatened or endangered species within the project area. Overall impacts to plant species of concern from implementation of the preferred alternative would be short and long term, negligible, and adverse. Impacts to wildlife species of concern from these projects would be localized, short term, negligible, and adverse due to construction activities. Long-term impacts to wildlife species of concern range from no long-term impacts to the Wupatki pocket mouse, ferruginous hawk, and Western burrowing owl; to long-term, minor, beneficial impacts to the pronghorn antelope and golden eagle.
Visitor Use and Experience	The no-action alternative would result in long-term, minor to moderate, adverse impacts on visitor use and experience.	Overall effects to visitor use and experience from the preferred alternative would be short term, moderate, and adverse, and long term, moderate, and beneficial.

Potential Environmental Impacts		
Impact Topic	**Alternative A: No Action**	**Alternative B: Preferred Alternative**
Monument Neighbors and Other Agencies	The no-action alternative would result in long-term, moderate, adverse impacts on monument neighbors and other agencies.	Short-term construction-related impacts to monument neighbors and other agencies would be moderate and adverse. The completion of the preferred alternative would result in long-term, moderate, beneficial impacts on monument neighbors and other agencies.
Monument Operations	There would be no change in monument operations under the no-action alternative; however, the existing condition constitutes a short- and long-term, minor to moderate, adverse impact to monument operations.	Implemenation of the preferred alternative would result in short-term, negligible, adverse impacts, and long-term, minor to moderate, beneficial impacts to monument operations.

AFFECTED ENVIRONMENT

Detailed information on resources of Wupatki and Sunset Crater can be found in the *General Management Plan* (NPS 2002a). This section provides a description of the monuments and identifies resources potentially affected by the Route 10 rehabilitation project. Since the majority of the rehabilitation work occurs within Wupatki, most discussions focus on the resources of Wupatki.

LOCATION AND GENERAL DESCRIPTION OF THE MONUMENT

Wupatki National Monument consists of 35,254 acres of high desert on the southwestern Colorado Plateau, directly west of the Little Colorado River and the Navajo Reservation. The monument is roughly divided in half by the Doney Monocline, with each half having distinct topography and geology. At lower elevations to the east of the monocline, Wupatki is dominated by sandstone and shale with saline soils. At higher elevations to the west of the monocline, Wupatki is dominated by limestone and volcanic formations with fertile soils (NPS 2002a). Elevations in the monument range from 4,280 to 5,720 feet above mean sea level. Wupatki has approximately 8 inches of precipitation annually. Summer temperatures can exceed 100 degrees Fahrenheit, while winters include mild daytime temperatures with nights often below freezing (NPS 2005a). Wupatki is the only known location in the Southwest where physical evidence from at least three archeologically separate ancestral Puebloan cultures is found together in a number of archeological sites (NPS 2005a). Wupatki is located 35 miles north of Flagstaff, Arizona, on U.S. 89. Wupatki, along with Sunset Crater, is accessed via Route 10, a 35-mile drive that forms a loop between Wupatki and Sunset Crater.

Sunset Crater Volcano National Monument consists of 3,040 acres representing the Colorado Plateau's most recent volcanic eruption. The monument includes a cinder cone that stands almost 1,000 feet high and associated geologic features including lava flows, lava tubes, cinder barrens, spatter cones, and an ice cave. The monument is located at approximately 7,000 feet in elevation above mean sea level. At Sunset Crater, summer temperatures are generally in the low 80s, with cool nights. Winters at Sunset Crater generally include average daytime highs in the 40s, with snow frequently covering the volcano.

ARCHEOLOGICAL RESOURCES

An inventory of archeological resources within Wupatki was completed in the mid-1980s, revealing a total of 2,668 archeological sites (Anderson 1990). This total did not include the four largest frontcountry sites—Wupatki, Wukoki, Citadel, and Nalakihu. Ongoing inventories of archeological resources have brought the total number of documented sites to 2,691. Site components recorded by these inventories are characterized according to their most predominant features. Site types included pithouse villages, pueblos, rock art sites, hogans, corrals, sweat lodges, slab-lined features, terraced field systems, armadas, isolated hearths, rock shelters, burials, cairns, dams and reservoirs, fences, walls, field houses, depressions, shrines, historic trash dumps, artifact scatters, borrow pits, borrow dumps, windbreaks, quarries, enclosures, check dams, earth cracks with evidence of use by American Indians, field systems, modified springs, and miscellaneous other historic sites.

The area of potential effect evaluated in this EA includes the existing roadbed, certain drainage culverts, the visitor center parking area, Doney Crater picnic area and turnout, Painted Desert turnout (new and existing), Doney Wash turnout, and the New Heiser maintenance area. All areas are previously

disturbed. Meredith Wilson and Deidre Morgan conducted a systematic survey of the Route 10 road right-of-way (a 125-foot/40-meter wide corridor) along the stretch of road considered in this EA in 2004. Seven new and 19 previously recorded sites were recorded in the corridor. The new sites include one in Wupatki, one on state land, and five on USFS land. After completion of the field work, archeological sites and areas with dense isolated occurrences were grouped into "sensitive resource areas." These areas were characterized by high site density within the right-of-way, complex and unstable topography, and substantial erosion. There were four sensitive resource areas identified along the length of the proposed Route 10 rehabilitation. Prior to any road disturbance in sensitive resource zones, an archeologist would remove any artifacts found. In addition, archeologists would be present during any road work in sensitive resource areas.

HISTORIC STRUCTURES AND DISTRICTS

The historic built environment at Wupatki represents two eras of National Park Service development. These two eras—dedicated to harmonizing, to the extent possible, the construction of roads, trails, and buildings—include the CCC period of rustic architecture and the Mission 66 era.

The Civilian Conservation Corps Era

In March 1933, President Franklin Delano Roosevelt sent a message to Congress in which he proposed to create a program for young men to be put to work on public lands and perform conservation-related tasks. Within 8 days, Congress passed the Emergency Conservation Work Act and by early April, Roosevelt appointed a director (Robert Fetchner) and advisory council, and appropriated $10,000,000 for the program. Almost immediately the Emergency Conservation Work Act became known as the CCC. There were no new agencies created to oversee the program. Instead, the Departments of War, Labor, Agriculture, and Interior managed the implementation of the Emergency Conservation Work Act/CCC.

The army initially designated 28 camps in Arizona, the first being a conditioning camp at Fort Huachuca (A-1-A). The first work camp was the USFS Treasure Park Camp (F-15-A). By the end of June 1933, there were 20 CCC camps spread across the state. Spanning the active years of the CCC, 1933–1942, 50 CCC camps were in Arizona and associated with the Bureau of Reclamation (2 camps), National Parks and Monuments (4 camps), Soil Conservation Service (15 camps), national forests (18 camps), state parks (4 camps), Division of Grazing (4 camps), municipalities (1 camp), U.S. Fish and Wildlife Service (1 camp), and county parks (1 camp). These camps employed 52,905 men who worked on a variety of projects ranging from construction to reforestation (e²M 2004).

Mission 66 Era

The Mission 66 program was a large-scale effort by the National Park Service to upgrade the national park infrastructure in the period after World War II. The heart of the initiative was the concept of a multifaceted visitor center with space dedicated to such roles as administrative offices, an information desk, restrooms, and exhibits. Mission 66 development also stressed visitor flow through both structures and buildings, but also roads and trails. Architecturally, the Mission 66 era marked a new era in park design as buildings became more modern and less ornamented.

The National Park Service prepared a determination of eligibility for the Wupatki Visitor Center Complex Historic District, which concludes that the district has historic significance at the national level as an excellent example of a CCC and Mission 66 development. Through a consensus determination of eligibility with the National Park Service and the Arizona SHPO, the Wupatki Visitor Center Complex Historic District has been determined to be nationally significant. The Wupatki Visitor Center Complex Historic District includes the following CCC-era building: custodian's residence (constructed by the CCC in 1940); and the Mission 66 buildings include: building 17 (maintenance building), building 11 (apartments), and buildings 10 and 12 (residences). The Wupatki National Monument Visitor Center is a composite building with both CCC and Mission 66 elements (CCC-constructed building, 1942; with a Mission 66 addition, 1965). Other contributing structures include the walkways and yards associated with the apartments (Mission 66), a flag pole (Mission 66), the visitor center walkways and parking area (Mission 66), and the administrative road area associated with the complex (NPS 2005b).

VEGETATION

Wupatki harbors a sizable natural area of relatively undisturbed vegetation habitats. Wupatki is roughly divided in half by the Doney Monocline, with each half having distinct geology, elevation, and dominant vegetation. At lower elevations to the east of the monocline, the monument is dominated by sandstone and shale geologic formation, saline soils, and open desert scrub vegetation. At higher elevations to the west of the monocline, the monument is dominated by limestone and volcanic formations, fertile soils, and juniper savanna and grassland vegetation (NPS 2002).

In view of the documented regional impacts of historic ranching activities, grasslands in the western half of Wupatki are still dominated by native perennial bunchgrasses and believed to be in good condition. Fencing and the presence of Route 10 divide the grassland habitat. Biologists are increasingly concerned about the growing population of juniper trees in the southwestern portion of the monument. The desert areas in the eastern half are more likely altered by Navajo sheep herding and ranching, especially the intermittent drainage system and riparian areas (NPS 2002).

There currently is little information on the distribution or impacts of nonnative plants within the monument. Nonnative plant infestations, predominantly Russian thistle (*Salsola kali*) and a few other small annual plant species, are generally confined to road corridors, developed areas, or areas of heavy visitation such as along trail corridors. These species benefit from the additional runoff associated with paved surfaces and often out-compete native vegetation along road shoulders. Nonnative plants may also rapidly colonize areas where the ground surface is heavily disturbed by equipment or heavy foot traffic. Annual brome-grasses (*Bromus spp.*) have been observed at Wupatki, but the area of infestation has yet to be assessed (NPS 2002).

THREATENED AND ENDANGERED SPECIES AND SPECIES OF CONCERN

Based on a review of the list of threatened and endangered species provided by the U.S. Fish and Wildlife Service (appendix B), there are no federally listed threatened or endangered plant or animal species known to occur in the project area (NPS 2002a, NPS 2004).

The Arizona Heritage Database was consulted for information on species of concern (appendix B). The Arizona Heritage Database is a source of information for species of concern drawing from various government entities throughout the state of Arizona. The database lists a total of 122 species of concern for Coconino County. Species of concern that are not U.S. Fish and Wildlife Service threatened or endangered

or proposed endangered include species of concern for the U.S. Fish and Wildlife Service, USFS, U.S. Bureau of Land Management, the Navajo National Heritage Program, and the state of Arizona. The list for Coconino County consists of 4 amphibians, 8 birds, 6 fish, 7 invertebrates, 16 mammals, 59 plants, and 3 reptiles (Arizona Heritage Data Management System 2005).

At Wupatki, there are three plant species of concern for which there are historic or recent records: Simpsons plains cactus (*Pediocactus simpsonii*), Cinder Phacelia (*Phacelia serrata*), and Whiting indigo bush (*Psorothamnus thompsoniae* var. *whitingi*). The distribution of these species within the monument is not well known. Another five species of concern are known from similar habitats near the monument, including Cameron water-parsley (*Cymopterus megacephalus*), Roundleaf errazurizia (*Errazurizia rotunda*), Fickeisen plains cactus (*Pediocactus peeblesianus* var. *ficleiseniae*), Welsh phacelia (*Phacelia welshii*), and Parish alkali grass (*Puccinella parishii*) (NPS 2002a). The area of potential effect for the proposed road construction is not expected to impact habitat where any of these species could be present.

A rare plant survey was preformed in the spring of 2005 by staff at Wupatki (NPS 2005c). Target species included the Simpson hedgehog cactus (*Pediocactus simpsonii*), Navajo pincushion cactus (*Pediocactus peeblesianus* var. *fickeiseniae*), sentry milkvetch (*Astragulus cremnophylax*, var. *hevronii*), largeleaf springparsley (*Cymopterus megacephalus*), roundleaf dunebroom (*Errazurizia rotundata*), and Peeble's bluestar (*Amsonia peeblesii*). Species of concern were selected based on previously documented presence in the monument or as target species due to similar habitat on adjacent land. No rare plant species were found during the survey; however, the survey results do not necessarily mean that rare plants are not present. The report recommended that additional surveys occur during early spring flowering periods.

Three animal species of concern are known to occur within the monument, including Wupatki pocket mouse (*Perognathus amplus cineris*), spotted bat (*Euderma maculatum*), and pale Townsend's big-eared bat (*Corynorhinus townsendii pallescens*). The Wupatki pocket mouse is documented in grasslands in the western half of the monument. Spotted bats and Townsend's big-eared bats occur in several of the cave-like karst features in the Lomaki/Box Canyon area. Two bird species of concern, the ferruginous hawk (*Buteo regalis*) and the Western burrowing owl (*Athene cunicularea hypugaea*), are known from similar habitats near the monument (NPS 2002a).

Although not formally listed as a species of concern, the pronghorn antelope (*Antilocapra Americana*) herd within Wupatki has been identified by the monument staff as a management issue. The pronghorn population has declined in and around Wupatki during the last few decades (Bright and Van Riper III 2000). The species is being affected by regional fragmentation and loss, including loss of habitat within the monument as juniper woodland takes over available grassland. However, the Wupatki grassland remains in relatively pristine condition with native perennial bunchgrasses that provide important habitat for the pronghorn antelope.

Boundary fencing has also played a role in restricting animal movement back and forth to water on adjacent lands; however, recent fence design modifications have largely corrected this problem. Existing roads within the monument are not fenced and, from time to time, animals are killed by automobiles (NPS 2002a).

A recent survey of pronghorn antelope in association with the Route 10 road corridor determined that the pronghorn antelope presence in habitat adjacent to the road corridor decreases in the late spring through early fall and increases in the fall through early spring (NPS 2005d). The changes in pronghorn presence follow the seasonal fluctuations in human activity through monument visitation, but also follow the seasonal fluctuations in water availability. The exact nature of the decrease in pronghorn presence during the summer months needs further investigation; however, monument visitation may

play a role in antelope use of habitat near the roadway. The pronghorn antelope survey recommended that turnouts be limited in areas of increased pronghorn antelope concentrations (NPS 2005d).

Although golden eagles (*Aquila chrysaetos*) are also not formally listed as a species of concern, their status within Wupatki has been identified by monument staff as a concern. Golden eagles have historically nested within the monument. The best nesting habitat within Wupatki, as evidenced by old nests and a recent survey, is in the Citadel Sink, Doney Mountain, and Deadman Wash areas (NPS 2005d). Eagles are known to be sensitive to human presence. If disturbed by noise or rapid movements, adult birds may fail to occupy a nest site or temporarily abandon their eggs or chicks. Monument managers typically close Citadel Pueblo to visitors during the breeding season (December to June) by the use of temporary barriers to the parking area.

VISITOR USE AND EXPERIENCE

Visitor surveys indicate that the majority of Wupatki/Sunset Crater visitors travel from south to north along Route 10. Most (68% to 70%) are engaged in a longer trip and are en route to Grand Canyon National Park and other points to the north. The typical visit is a drive-through visit including a stop at the visitor center and museum exhibits and walks to one or two of the pueblos. Major pueblos (Wupatki, Wukoki, Lomaki, Citadel) have been developed for self-guided interpretation and "hardened" for visitation; these sites are reached via short spur trails leading from parking areas. Short interpretive programs, both talks and guided walks, are offered when staffing permits. The Crack-in-Rock area and other backcountry sites are visited via ranger-led programs available four to eight times per year. The rest of the monument is currently closed to visitation (NPS 2002a).

Many significant features occur outside of the monument boundaries on USFS or private land. Many monument visitors remain unaware of their existence, with the exception of those who stop at the Doney Mountain picnic area and viewpoint, where interpretive displays inform visitors of the geology and archeology of the Doney Mountain area. Recreational opportunities including hiking, horseback riding, mountain biking, backpacking, four-wheel drive excursions, and off-highway vehicle use, are available on nearby USFS lands (NPS 2002a).

MONUMENT NEIGHBORS AND OTHER AGENCIES

The western two-thirds of Wupatki's south boundary is shared with the Coconino National Forest. The eastern one-third is predominately privately owned land. State-owned lands border the western boundary. The Coconino Plateau Natural Reserve Lands, formerly known as Babbitt Ranches, and a checkerboard of state-owned sections exist along the north boundary. The east boundary of Wupatki is shared with the Navajo Reservation. The east and west sides of Wupatki are defined by the Little Colorado River and U.S. 89, respectively (NPS 2002a).

Monument neighbors and other agencies include residents of Alpine Ranchos, a community located south of Wupatki, and residents of CO Bar Ranch. Although several miles distant, the residents identify with the monument, often stopping at the visitor center to request assistance from law enforcement rangers, to report crimes, and so on. Many are dependent on the National Park Service for road access to and from Flagstaff. Small businesses such as Hank's and Sinagua Trading Post, located along U.S. 89 on the north and south boundaries of the monument, also identify with Wupatki. In many instances, towing services provided by these small businesses are solicited by stranded visitors (NPS 2002a).

Similarly, many Navajo Reservation residents pass through Wupatki and depend on monument resources to serve a variety of needs, including maintenance of their main travel route and access to traditional cultural properties and ethnographic resources. Reservation communities and Alpine Ranchos have expressed some concerns over any plans to terminate roads in the monument, particularly as to effects on their quality of life, increased commuting time, and diminished access to conveniences such as gas, telephone, mail, and groceries (NPS 2002a).

Several affiliated tribes have identified traditional relationships and/or cultural properties within monument boundaries and have concerns about public access to sites; some groups need access to restricted use areas for plant gathering and traditional activities. Consultation with these tribes is routine and ongoing (NPS 2002a).

The area is of great interest to various agencies involved in research, including the U.S. Geological Survey, Northern Arizona University, and others who, although they do not own or administer any lands, will have an interest in management decisions affecting the resources of the area (NPS 2002a). There are over 50 research permits currently granted within monument boundaries. Monitoring equipment associated with some of these research permits is located at various locations throughout the monument.

MONUMENT OPERATIONS

The National Park Service currently has the primary responsibility for the maintenance of Route 10; however, operational deficits significantly limit the nature and frequency of maintenance activities. Additional responsibilities include plowing the roadway during the winter months. Monument staff are required to direct traffic at the visitor center parking area on bus days to ensure buses do not stop in the traffic circle to unload passenegrs and that traffic continues to flow smoothly. Monument staff also spend time erecting temporary barriers to the Citadel Pueblo parking area during raptor nesting and are required to continually monitor the area to ensure that visitors have not bypassed the temporary barriers, potentially disturbing nesting raptors.

ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This section describes the potential environmental consequences associated with the no-action and preferred alternatives. The methodologies and assumptions for assessing environmental consequences are discussed, including consideration of context, intensity, type, and duration of impacts; cumulative impacts; and measures to mitigate impacts. As mandated by National Park Service policy, resource impairment is explained and then assessed for each alternative. Subsequent sections are organized by impact topic, first for the no-action alternative, and then for the National Park Service preferred alternative.

METHODOLOGY

Overall, the National Park Service based these impact analyses and conclusions on the review of existing literature and Wupatki studies, information provided by experts within Wupatki and other agencies, professional judgments and monument staff insights, and public input.

The following definitions were used to evaluate the context, intensity, type, duration, and cumulative nature of impacts associated with 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 impact analysis include discussions of context.

- *Impact Intensity.* Impact intensity is the degree to which a resource would be beneficially or adversely affected. The criteria that were used to rate the intensity of the impacts for each resource topic are presented later in this section under each resource topic heading.

- *Type of Impact.* Impacts can be beneficial or adverse. Beneficial impacts would improve resource conditions while adverse impacts would deplete or negatively alter resources.

- *Duration.* The duration of the impacts in this analysis is defined as short term or long term. The duration for each resource topic is presented later in this section under each resource topic heading.

The National Park Service is required to consider direct and indirect impacts in the analysis, however, for an EA, the analysis is not identified in the document. The following definitions of direct and indirect impacts are considered:

- direct – an effect that is caused by an action and occurs at the same time and place
- indirect – an effect that is caused by an action, but is later in time or farther removed in distance, but still reasonably foreseeable

Potential impacts are described in terms of context, intensity, type, duration, and impairment.

IMPACT INTENSITY THRESHOLDS

Archeological Resources

Certain important research questions about human history can only be answered by the actual physical material of cultural resources. Archeological resources have the potential to answer, in whole or in part, such research questions. An archeological site(s) can be eligible to be listed in the NRHP if the site(s) has yielded, or may be likely to yield, information important in prehistory or history. An archeological site(s) can be nominated to the NRHP in one of three historic contexts or levels of significance: local, state, or national (see *National Register Bulletin #15, How to Apply the National Register Criteria for Evaluation*). For purposes of analyzing impacts to archeological resources, thresholds of change for the intensity of an impact are based on the potential of the site(s) to yield information important in prehistory or history, as well as the probable historic context of the affected site(s). Following are the impact threshold definitions for archeological resources:

Impact Intensity	Intensity Definition
Negligible	Impact(s) is at the lowest levels of detection with neither adverse nor beneficial consequences. The determination of effect for section 106 would be *no adverse effect.*
Minor	**Adverse Impact:** Disturbance of a site(s) results in little, if any, loss of integrity. The determination of effect for section 106 would be *no adverse effect.*
	Beneficial Impact: Maintenance and preservation of a site(s). The determination of effect for section 106 would be *no adverse effect.*
Moderate	**Adverse Impact:** Disturbance of a site(s) results in loss of integrity. The determination of effect for section 106 would be *adverse effect.* A memorandum of agreement is executed among the National Park Service and applicable state or tribal historic preservation officer and, if necessary, the Advisory Council on Historic Preservation in accordance with 36 CFR 800.6(b). Measures identified in the memorandum of agreement to minimize or mitigate adverse impacts reduce the intensity of impact under NEPA from major to moderate.
	Beneficial Impact: Stabilization of a site(s). The determination of effect for section 106 would be *no adverse effect.*
Major	**Adverse Impact:** Disturbance of a site(s) results in loss of integrity. The determination of effect for section 106 would be *adverse effect.* Measures to minimize or mitigate adverse impacts cannot be agreed on and the National Park Service and applicable state or tribal historic preservation officer and/or Advisory Council on Historic Preservation are unable to negotiate and execute a memorandum of agreement in accordance with 36 CFR 800.6(b).
	Beneficial Impact: Active intervention to preserve a site(s). The determination of effect for section 106 would be *no adverse effect.*

Impacts to archeological resources would be considered long term as the resource is nonrenewable.

Historic Structures

In order for a historic structure to be eligible for the NRHP, it must meet one or more of the following criteria of significance: (1) associated with events that have made a significant contribution to the broad patterns of our history; (2) associated with the lives of persons significant in our past; (3) embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master,

or possess high artistic value, or represent a significant and distinguishable entity whose components may lack individual distinction; and/or (4) have yielded, or may be likely to yield, information important in prehistory or history. In addition, the historic structure must possess integrity of location, design, setting, materials, workmanship, feeling, and association (*National Register Bulletin, Guidelines for Evaluating and Registering Archeological Properties*). For purposes of analyzing impacts to historic structures, either listed in or eligible to be listed in the NRHP, the thresholds of change for intensity of an impact are defined below:

Impact Intensity	Intensity Definition
Negligible	Impact(s) is at the lowest levels of detection with neither adverse nor beneficial consequences. The determination of effect for section 106 would be *no adverse effect.*
Minor	**Adverse Impact:** Alteration of a feature(s) would not diminish the overall integrity of the resource. The determination of effect for section 106 would be *no adverse effect.*
	Beneficial Impact: Stabilization/preservation of character-defining features in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties.* The determination of effect for section 106 would be *no adverse effect.*
Moderate	**Adverse Impact:** Alteration of a feature(s) would diminish the overall integrity of the resource. The determination of effect for section 106 would be *adverse effect.* A memorandum of agreement is executed among the National Park Service and applicable state or tribal historic preservation officer and, if necessary, the Advisory Council on Historic Preservation, in accordance with 36 CFR 800.6(b). Measures identified in the memorandum of agreement to minimize or mitigate adverse impacts reduce the intensity of the impact under NEPA from major to moderate.
	Beneficial Impact: Rehabilitation of a structure in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties.* The determination of effect for section 106 would be *no adverse effect.*
Major	**Adverse Impact:** Alteration of a feature(s) would diminish the overall integrity of the resource. The determinations of effect for section 106 would be *adverse effect.* Measures to minimize or mitigate adverse impacts cannot be agreed on and the National Park Service and applicable state or tribal historic preservation officer and/or Advisory Council on Historic Preservation are unable to negotiate and execute a memorandum of agreement in accordance with 36 CFR 800.6(b).
	Beneficial impact: Restoration of a structure in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties.* For purposes of section 106, the determination of effect would be *no adverse effect.*

The effects to historic structures are considered short term if the effects last for less than 1 year and long term if the effects last longer than 1 year, or are permanent.

Threatened and Endangered Species and Species of Concern

It is the policy of the National Park Service to manage habitat of threatened and endangered species and species of concern and to perpetuate the natural distribution and abundance of these species as well as the ecosystems upon which they depend. Information on species of special concern was gathered from published sources. Information from prior research at Wupatki was also incorporated. Known impacts caused by development and human use were also considered. The thresholds of change for the intensity of an impact are defined as follows:

Impact Intensity	Intensity Definition
Negligible	The action could result in a change to a population or individuals of a species or their habitat, but the change would be so small that it would not be of any measurable or perceptible consequence and would be well within natural variability.
Minor	The action could result in a change to a population or individuals of a species or their habitat. The change would be measurable, but small and localized and of little consequence. Mitigation measures, if needed to offset the adverse effects, would be simple and successful.
Moderate	Impacts on species of concern, their habitats, or the natural processes sustaining them would be detectable and occur over a large area. Mitigation measures, if needed to offset adverse effects, would be extensive and likely successful.
Major	The action would result in a noticeable effect to viability of a population or individuals of a species of concern or their habitat. Impacts would be detectable, both in and out of the monument. Loss of habitat might affect the viability of at least some species of concern. Extensive mitigation measures would be needed to offset any adverse effects and their success would not be guaranteed.

Impacts are considered short term if the species recovers in less than 1 year and long term if it takes longer than 1 year for the species to recover.

Visitor Use and Experience

NPS *Management Policies* (2001) state that the enjoyment of monument resources and values by the people of the United States is part of the fundamental purpose of all parks and that the National Park Service is committed to providing appropriate, high-quality opportunities for people to enjoy the parks.

Part of the purpose of Wupatki is to offer opportunities for recreation, education, inspiration, and enjoyment. Consequently, one of the monument's management goals is to ensure that visitors safely enjoy and are satisfied with the availability, accessibility, diversity, and quality of monument facilities, services, and appropriate recreational opportunities.

Public scoping input and observation of visitation patterns, combined with an assessment of what is available to visitors under current management, were used to estimate the effects of the actions in the various alternatives of this document. The impact on the ability of the visitor to experience a full range of Wupatki resources was analyzed by examining resources and objectives presented in the monument significance statement. The thresholds of change for the intensity of an impact to visitor experience are defined as follows:

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 be slight and not noticeable by most visitors.
Moderate	Changes in visitor use and/or experience would be readily apparent to most 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.

Impacts to visitor use and experience are considered short term if the effects last only as long as the construction period. Impacts are considered long term if the effects last longer than the construction period.

Monument Neighbors and Other Agencies

Wupatki has many neighbors who routinely use Route 10 for commuting and access to private lands adjacent to national monument lands. Neighbors rely on the road to provide a transportation route. Monument neighbors and other agencies make up a large portion of the users of Route 10, but are neither visitors nor monument employees. Monument neighbors and other agencies would be affected by either the no-action or preferred alternatives. As a result, impacts to monument neighbors and other agencies are examined in detail and impact threshold levels are defined below.

Impact Intensity	Intensity Definition
Negligible	Monument neighbors would not be affected or any effects to monument neighbors would be below or at the level of detection. The monument neighbor would not likely be aware of the effects associated with the alternative.
Minor	Changes would be detectable to monument neighbors, although the changes would be slight. Some monument neighbors and other agencies would be aware of the effects associated with the alternative, but the effects would be slight and not noticeable by most monument neighbors and other agencies.
Moderate	Changes would be readily apparent to most monument neighbors and other agencies. Monument neighbors and other agencies would be aware of the effects associated with the alternative and might express an opinion about the changes.
Major	Changes would be readily apparent to all monument neighbors and other agencies, and would be severely adverse or exceptionally beneficial. Monument neighbors and other agencies would be aware of the effects associated with the alternative and would likely express a strong opinion about the changes.

The effects to monument neighbors and other agencies are considered short term if the effects last for the period of construction and long term if the effects last beyond the period of construction.

Monument Operations

Monument operations, for the purpose of this analysis, refers to the quality and effectiveness of the infrastructure and the ability to maintain the infrastructure used in the operation of the monument in order to adequately protect and preserve vital resources and provide for an appropriate visitor experience. This includes an analysis of the condition and usefulness of the facilities and developed features used to support the operations of the monument. Facilities included in this project include Route 10 and associated parking areas and turnouts.

Monument staff with knowledge of these issues are members of the planning team that evaluated the impacts of each alternative. Impact analysis is based on the current description of monument operations presented in the "Affected Environment" section of this document. An alternative is assumed to have an impact, either adverse or beneficial, on monument operations and facilities if it: (1) results in direct changes to monument operations, facilities, or staffing requirements or policies associated with monument operations; or (2) causes indirect effects on monument operations, facilities, or staffing. Following are the impact thresholds for monument operations:

Impact Intensity	Intensity Definition
Negligible	Monument operations would not be affected, or the effects would be at low levels of detection and would not have an appreciable effect on monument operations.
Minor	The effect would be detectable and likely short term, but would be of a magnitude that would not have an appreciable effect on monument operations. If mitigation was needed to offset adverse effects, it would be simple and likely successful.
Moderate	The effects would be readily apparent, likely long term, and would result in a substantial change in monument operations in a manner noticeable to staff and to the public. Mitigation measures would b necessary to offset adverse effects and would likely be successful.
Major	The effects would be readily apparent, long term, would result in a substantial change in monument operations in a manner noticeable to staff and the public, and be markedly different from existing operations. Mitigation measures to offset adverse effects would be needed, would be extensive, and their success could not be guaranteed.

The effects to monument operations are considered short term if the effects last only during construction and long term if the effects last longer than the construction period.

Cumulative Effects

Cumulative effects are the impacts on the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of the agency (federal or nonfederal) or person undertaking such action. Cumulative effects can result from individually minor, but collectively substantial actions taking place over a period of time.

The Council on Environmental Quality regulations, which implement NEPA, require 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 impacts are considered for all alternatives 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 within the area surrounding Wupatki were identified. Projects were determined by discussions with the staff of Wupatki. 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 a particular natural resource, cultural resource, visitor use, or the socioeconomic environment. Because some of these cumulative actions are in the early planning stages, the evaluation of cumulative effects was based on a general description of the project.

Past Actions

The following past actions could contribute to cumulative effects:

- Phase I road improvements for Route 10, including resurfacing of the road and associated drainage controls.

Current and Reasonably Foreseeable Future Actions

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

- The last phase of U.S. 89 improvements that would include widening of the roadway to four lanes, including installation of a median. The proposed improvements would be within the existing highway right of way.
- The rehabilitation of the Wupatki Visitor Center, including installation of upgraded electrical systems, carpeting, and visitor exhibits.
- Removal of housing at New Heiser.
- Rehabilitation of monument sewerlines, including replacement of lines and installation of new valving.

IMPAIRMENT OF WUPATKI 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 Wupatki resources or values.

The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. National Park Service 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

National Park Service management discretion to allow impacts to monument resources and values when necessary and appropriate to fulfill the purposes of a monument, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given National Park Service management discretion to allow certain impacts within parks, that discretion is limited by statutory requirements that the National Park Service must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgment of the responsible National Park Service manager, would harm the integrity of park resources or values, including opportunities that otherwise would be present for the enjoyment of those resources or values. An impact to any park resource or value may constitute impairment. However, an impact would more likely constitute an 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 monument
- key to the natural or cultural integrity of the monument or to opportunities for enjoyment of the monument
- identified as a goal in the Wupatki *General Management Plan* or other relevant National Park Service planning documents

Impairment may result from National Park Service activities in managing the monument, visitor activities, or activities undertaken by concessioners, contractors, and others operating in the 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 National Park Service does not analyze recreational values / visitor experience (unless impacts are resource based), socioeconomic values, health and safety, or monument operations for impairment.

Impacts to Cultural Resources and Section 106 of the National Historic Preservation Act

In this EA, 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 Part 800, *Protection of Historic Properties*), impacts to archeological and cultural resources were identified and evaluated by (1) determining the area of potential effects; (2) identifying cultural resources present in the area of potential effects that were either listed in or eligible to be listed in the NRHP; (3) applying the criteria of adverse effect to affected cultural resources either listed in or eligible to be listed in the NRHP; and (4) considering ways to avoid, minimize, or mitigate adverse effects.

Under Advisory Council regulations a determination of either *adverse effect* or *no adverse effect* must also be made for affected NRHP-eligible cultural resources. An adverse effect occurs whenever an impact alters, directly or indirectly, any characteristics of a cultural resource that qualify it for inclusion in the NRHP, 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 Part 800.5, *Assessment of Adverse Effects*). A determination of no adverse effect means there is an effect, but the effect would not diminish in any way the characteristics of the cultural resource that qualify it for inclusion in the NRHP.

Council on Environmental Quality regulations and the National Park Service's *Conservation Planning, Environmental Impact Analysis, and Decision-making* (Director's Order – 12) also call for a discussion of the appropriateness of mitigation, as well as an analysis of how effective the mitigation would be in reducing the intensity of 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 archeological and cultural resources under the preferred alternative. The section 106 summary is an assessment of the effect of the undertaking (implementation of the alternative) on NRHP eligible or listed cultural resources only, based on the criterion of effect and criteria of adverse effect found in Advisory Council regulations.

ENVIRONMENTAL CONSEQUENCES—ALTERNATIVE A: NO ACTION

Archeological Resources

There would be no new ground disturbance as a result of the no-action alternative; however, existing conditions constitute a potential impact to archeological resources (NPS 2003). If Route 10 is allowed to further deteriorate, the resulting road material eroding onto the adjacent archeological resources would have the potential to impact the NRHP significance and scientific integrity of at least 26 archeological sites identified in the road survey. Road edge raveling and erosion of the shoulder material, as well as potential drainage problems and failure, could cause road material to intermingle with archeological artifacts or cause erosion and removal of those resources by wind or water. Such impacts to archeological resources would be long term, minor, and adverse.

Cumulative Impacts. Past, present, and reasonably foreseeable future projects with the potential to affect archeological resources include the last phase of improvements to U.S. 89, the removal of housing at New Heiser, and improvements to monument sewerlines. The phase I resurfacing of Route 10 was completed within the existing previously disturbed roadway corridor. The New Heiser site has also been previously disturbed and it is unlikely that archeological resources would be further impacted by building removal. Improvements to monument sewerlines could impact archeological resources during construction activities; however, the disturbance areas would be surveyed prior to any disturbance and the work relocated or, if unable to relocate, any sites found would be mitigated through collection, recording, and consultation with the Arizona SHPO. However, based on impact intensity definitions, any impacts that result in loss of integrity, regardless of mitigation, constitute at least a moderate impact. The effects of past, present, and reasonably foreseeable future actions on archeological resources would be long term, moderate, and adverse. Overall cumulative impacts to archeological resources from past, present, and reasonably foreseeable future actions, in conjunction with the no-action alternative, would be long term, minor to moderate, and adverse.

Conclusion. Impacts to archeological resources from the no-action alternative would be long term, minor, and adverse. Continued road edge raveling and erosion of the shoulder material, as well as potential drainage problems and failure, would cause road material to intermingle with archeological artifacts or cause erosion and removal of those resources by wind or water. Overall cumulative impacts to archeological resources from past, present, and reasonably foreseeable future actions, in conjunction with the no-action alternative, would be long term, minor to moderate, and adverse. There would be no impairment of monument resources or values.

Historic Structures and Districts

No action would be taken in this alternative; therefore, there would be no impact to historic structures and districts.

Cumulative Impacts. Past, present, and reasonably foreseeable future projects with the potential to affect historic structures and districts include the current rehabilitation of the Wupatki Visitor Center and replacement of monument sewerlines. The Wupatki Visitor Center rehabilitation work consists of replacement of electrical systems, new carpeting, and updating visitor center exhibits, and is being conducted within the *Secretary of the Interior's Standards for the Treatment of Historic Properties.* Sewerline improvements would be conducted in a manner to minimize the long-term impacts to historic structures and districts, although some short-term visual impacts could occur. The sewerlines are buried and on replacement, the trenches would be reclaimed and revegetated with species similar in nature to those existing in the historic district. Overall cumulative impacts from past, present, and reasonably foreseeable future activities would result in negligible impacts to the historic structures and districts. Because the no-action alternative would have no impact to historic structures and districts, there would be no cumulative impacts.

Conclusion. No action would be taken in this alternative; therefore, there would be no impact to historic structures and districts. Because the no-action alternative would have no impact to historic structures and districts, there would be no cumulative impacts. There would be no impairment of monument resources or values.

Threatened and Endangered Species and Species of Concern

There are no known threatened or endangered species within the project area. No action would be taken in this alternative; therefore, there would be no new impacts to species of concern. Plant species of concern would not be disturbed; however, wildlife species of concern would continue to be subjected to the road traffic. There is a negligible potential for an impact on wildlife crossing the road, which could be injured or killed by vehicles. Impacts associated with human activity (noise, harassment, feeding) would also continue to have a negligible to minor adverse impact. Both the pronghorn antelope and golden eagle are sensitive to human activities along the road corridor. Pronghorn antelope may continue to avoid the road corridor during months of high visitation; however, additional research is necessary to determine if visitor activity or the lack of water availability or a combination of these factors are responsible for the antelope movement away from the road corridor. Nesting golden eagles would be impacted by the temporary nature of the closure of the Citadel Pueblo parking area. The current temporary closure allows visitors to bypass the barriers and enter the parking area, which would cause the golden eagles to abandon their nests. The impacts to species of concern would be long term, negligible to minor, and adverse.

Cumulative Impacts. Since there are no threatened or endangered species that would be impacted by the no-action alternative, cumulative impacts could occur only to species of concern. Past, present, and reasonably foreseeable future projects with the potential to affect species of concern include the phase 1 resurfacing of Route 10, the last phase of improvements to U.S. 89, the removal of housing at New Heiser, and improvements to monument sewerlines. These cumulative actions would have the potential to temporarily disrupt native habitats, affecting the abundance and diversity of special-status species by altering the capacity of habitats to provide necessary food, shelter, and reproduction sites. Once construction is completed, projects within the monument would have a revegetation component that

would reestablish native habitat over the long term. The cumulative impacts to species of concern could result in detectable changes to these species, but such changes would be small and localized. Cumulative effects would be short and long term, minor, and adverse. The no-action alternative would contribute long-term, negligible to minor, adverse impacts to species of concern. The overall cumulative impacts from past, present, and reasonably foreseeable future actions, including the no-action alternative, would be long term, minor, and adverse.

Conclusion. The impacts to wildlife species of concern would be long term, negligible to minor, and adverse. Impacts would be associated with human activity and road traffic through continued use of the road. The overall cumulative impacts from past, present, and reasonably foreseeable future actions, including the no-action alternative, would be long term, minor, and adverse. There would be no impairment of monument resources or values.

Visitor Experience

The no-action alternative would leave the road in its existing condition with cracking and raveling pavement. Although it is not anticipated that road conditions would affect visitation numbers, the road surface would continue to deteriorate, potentially impacting visitor experience because road segment conditions may necessitate periodic road closures to make repairs and would result in a rough and unpleasant driving experience. Deteriorated roads could also cause increased accidents. The longer Route 10 is allowed to deteriorate, the greater the impact. The visitor center parking area would continue to create visitor traffic delays while buses unload in the traffic circle. In cases where drainage controls are inadequate, the entire road could fail, causing closure to visitors. The monument experience is primarily a driving experience so most visitors would be aware of the poor road conditions. As a result, the no-action alternative would result in long-term, minor to moderate, adverse impacts on visitor use and experience.

Cumulative Impacts. Past, present, and reasonably foreseeable future projects with the potential to affect visitor use and experience include the rehabilitation of the Wupatki Visitor Center, the phase 1 resurfacing of Route 10, the last phase of improvements to U.S. 89, and improvements to monument sewerlines. 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 to some, but not all visitors. These activities would have short-term, minor, adverse impacts on visitor experience for the duration of construction activities.

Over the long term, visitor use and experience would be improved by the rehabilitation projects. Improvements associated with each of these projects (e.g., rehabilitated road surfaces, improved infrastructure, and new or rehabilitated facilities) would improve the overall visitor use and experience for those areas and the improvements would be apparent to some visitors. The improvements would have long-term, minor, beneficial effects on visitor experience; however, Route 10, the primary way visitors view monument resources, would continue to be in poor condition.

The no-action alternative would contribute long-term, minor to moderate, adverse, cumulative impacts to visitor use and experience and the overall impacts from past, present, and reasonably foreseeable future activities in association with the no-action alternative would be short term and long term, minor, and adverse.

Conclusion. The no-action alternative would result in long-term, minor to moderate, adverse impacts on visitor use and experience. Visitors would continue to experience poor road conditions, potential

traffic delays due to road closures for repairs, and potential delays for buses unloading at the Wupatki visitor center. The no-action alternative would contribute long-term, minor to moderate, adverse, cumulative impacts to visitor use and experience and the overall impacts from past, present, and reasonably foreseeable future activities in association with the no-action alternative would be short term and long term, minor, and adverse.

Monument Neighbors and Other Agencies

The no-action alternative would leave the road in its existing condition with cracking and raveling pavement. The road surface would continue to deteriorate, creating a rough and unpleasant riding condition. Road segment conditions may necessitate periodic road closures to make repairs. Newly renovated road sections that are experiencing problems with drainage and shoulders would continue to deteriorate. The longer the current road is allowed to deteriorate, the greater the impact. Unlike monument visitors who likely would only be subjected to these conditions for the length of their visit to the monument, monument neighbors and other agencies would experience the poor road conditions on a daily basis. The no-action alternative would result in long-term, moderate, adverse impacts on monument neighbors and other agencies.

Cumulative Impacts. Past, present, and reasonably foreseeable future projects with the potential to affect monument neighbors and other agencies include the phase 1 resurfacing of Route 10 and the last phase of improvements to U.S. 89. The short-term effects to monument neighbors and other agencies would be related to construction noise, the presence of construction equipment, and construction-related traffic delays or closures. The cumulative projects would be spread throughout the monument area and would not occur at the same time. However, monument neighbors would be aware of all of the projects. These activities would have short-term, moderate, adverse impacts on monument neighbors and other agencies for the duration of construction activities.

Over the long-term, monument neighbors and other agencies access would be improved by the projects. Improvements associated with each of these projects (e.g., rehabilitated road surfaces, improved access to U.S. 89) would facilitate travel for monument neighbors. The improvements would have long-term, minor, beneficial effects on monument neighbors and other agencies; however, the majority of Route 10 access for monument neighbors and other agencies would continue to be in poor condition and previously rehabilitated sections could be subject to failure due to uncorrected drainage and shoulder problems.

The no-action alternative would contribute long-term, moderate, adverse impacts to monument neighbors and other agencies and the overall impacts from past, present, and reasonably foreseeable future activities in association with the no-action alternative would be short term and long term, moderate, and adverse.

Conclusion. The no-action alternative would result in long-term, moderate, adverse impacts on monument neighbors and other agencies. Monument neighbors would drive the deteriorated road every day and could experience delays due to road closures for repairs. The no-action alternative would contribute long-term, moderate, adverse impacts to monument neighbors and other agencies and the overall impacts from past, present, and reasonably foreseeable future activities in association with the no-action alternative would be short term and long term, moderate, and adverse.

Monument Operations

Under the no-action alternative, there would be no change to existing monument operations. The no-action alternative would continue with existing monument operations requirements for maintenance and repair to Route 10. In addition, the previously rehabilitated road sections where drainage control problems and poorly compacted shoulders exist could experience failure requiring immediate road work or the need for ongoing maintenance. As the road continues to deteriorate, required maintenance would likely increase. Monument staff would continue to be required to direct traffic at the visitor center parking area on busy days to ensure that buses do not stop in the traffic circle to unload passengers. Monument staff would also spend time erecting temporary barriers to the Citadel Pueblo parking area and would also be required to continually monitor to ensure that visitors have not bypassed the temporary barriers. There would be no change in monument operations under the no-action alternative; however, the existing condition constitutes a short- and long-term, minor to moderate, adverse impact to monument operations.

Cumulative Impacts. Past, present, and reasonably foreseeable future projects with the potential to affect monument operations include the phase 1 resurfacing of Route 10, the removal of housing at New Heiser, and improvements to monument sewerlines. Monument maintenance operations would be reduced by the phase I improvements to Route 10 as well as the improvements to the sewerlines. Monument staff would spend less time on repairs to the existing sewer system as well as to the road system. Long-term impacts to monument operations would be minor and beneficial. Monument operations could be negatively impacted in the short term by the sewerline improvements and removal of housing at New Heiser, depending on the amount of staff time required for oversight or actual labor to complete these improvements. Short-term impacts to monument operations would be minor and adverse, depending on the staff time required for these projects.

The no-action alternative would contribute short- and long-term, minor to moderate, adverse impacts to monument operations and the overall cumulative impacts to monument operations from past, present, and reasonably foreseeable future projects would be short term, minor to moderate, and adverse, and long term, minor, and adverse.

Conclusion. There would be no change in monument operations under the no-action alternative. The existing road condition would have short- and long-term, minor to moderate, adverse impacts to monument operations. As the road continues to deteriorate, maintenance needs would increase as would the potential need for emergency road repairs. Monument staff would be needed to direct traffic at the Wupatki visitor center on busy days and to erect temporary barriers at Citadel Pueblo. The no-action alternative would contribute short- and long-term, minor to moderate, adverse impacts to monument operations and the overall cumulative impacts to monument operations from past, present, and reasonably foreseeable future projects would be short term, minor to moderate, and adverse, and long term, minor, and adverse.

ENVIRONMENTAL CONSEQUENCES—ALTERNATIVE B: PREFERRED ACTION

Archeological Resources

The survey report completed in 2005, for archeological resources along the planned construction corridor, states that the project area is extensively disturbed and all construction equipment and vehicles would be confined to the existing road prism (Wilson and Morgan 2005). Any potential disturbance would be limited to 5 feet from the road edge or disturbed area (3 feet in sensitive resource zones). In sensitive resource zones, surface collection of artifacts would occur prior to any disturbance. All ground-disturbing activities would be limited to the nonnative gravel base of the roadbed. An archeological monitor would be present during all aspects of the project that involve ground disturbance.

Since construction would occur only in areas that have been extensively disturbed by past activities and mitigation including monitoring and artifact collection would be implemented, the potential for adversely affecting intact archeological resources is minor.

Cumulative Impacts. Past, present, and reasonably foreseeable future projects with the potential to affect archeological resources include the last phase of improvements to U.S. 89, the removal of housing at New Heiser, and improvements to monument sewerlines. The phase I resurfacing of Route 10 was completed within the existing previously disturbed roadway corridor. The New Heiser site has also been previously disturbed and it is unlikely that archeological resources would be further impacted by building removal. Improvements to monument sewerlines could impact archeological resources during construction activities; however, the disturbance areas would be surveyed prior to any disturbance and the work relocated or, if unable to relocate, any sites found would be mitigated through collection, recording, and consultation with the Arizona SHPO. However, based on impact intensity definitions, any impacts that result in loss of integrity, regardless of mitigation, constitute at least a moderate impact. The effects of past, present, and reasonably foreseeable future actions on archeological resources would be long term, moderate, and adverse; however, the preferred alternative would provide only negligible contributions to the cumulative impacts.

Conclusion. Since construction would occur only in areas that have been extensively disturbed by past activities and mitigation (including monitoring and surface collection) would be implemented, the potential for adversely affecting intact archeological resources is minor and long term. The effects of past, present, and reasonably foreseeable future actions on archeological resources would be long term, moderate, and adverse; however, the preferred alternative would provide only negligible contributions to the cumulative impacts. here would be no impairment of monument resources or values.

Section 106 Summary. Under 36 CFR 800, *Protection of Historic and Cultural Properties*, an adverse effect occurs whenever an impact alters, directly or indirectly, any characteristic of a cultural resource that qualifies it for inclusion in the NRHP, e.g., diminishing the integrity (or the extent to which a resource retains its historic appearance) of its location, design, setting, materials, workmanship, feeling, or association.

Under the preferred alternative, there would be minor adverse impacts to archeological resources as a result of the planned road construction. After applying Advisory Council on Historic Preservation criteria of adverse effect (36 CFR 800.5), the National Park Service determined that the activities proposed in the preferred alternative would have *no adverse effect* to archeological resources.

Historic Structures and Districts

Changes to the visitor center parking area and sidewalks, and installation of a fountain and benches under the preferred alternative would affect the footprint and some of the materials of the visitor center walkways and parking area—a contributing resource of the Wupatki National Monument Visitor Center Historic District. However, the removal of distinctive materials or alteration of features, spaces, and spatial relationships that characterize a property would be avoided. Curbing and sidewalk additions at the Wupatki Visitor Center would adhere to the *Secretary of the Interior's Standards for the Treatment of Historic Properties* by matching the existing features in design, color, texture, and where possible, materials. Effects to historic structures and districts would be long term, minor, and adverse.

Cumulative Impacts. Past, present, and reasonably foreseeable future projects with the potential to affect historic structures and districts include the current rehabilitation of the Wupatki Visitor Center and replacement of monument sewerlines. The Wupatki Visitor Center rehabilitation work consists of replacement of electrical systems, new carpeting, and updating visitor center exhibits. The rehabilitation work is being conducted within the *Secretary of the Interior's Standards for the Treatment of Historic Properties.* Sewerline improvements would be conducted in a manner to minimize the long-term impacts to historic structures and districts, although some short-term visual impacts could occur. The sewerlines are buried, and on replacement, the trenches would be reclaimed and revegetated with species similar in nature to those existing in the historic district. Overall cumulative actions from past, present, and reasonably foreseeable future activities would result in long-term, negligible impacts to the historic structures and districts. Because the preferred alternative would have long-term, minor, adverse impacts on historic structures and districts, it would contribute a noticeable impact to the overall cumulative impacts from past, present, and reasonably foreseeable future actions, which would result in long-term, minor, and adverse impacts.

Section 106 Summary. Under 36 CFR 800, *Protection of Historic and Cultural Properties*, "an undertaking is considered to have an adverse effect when the effect on a historic property may diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association."

Under the preferred alternative, the historic structures would be renovated. Such action is consistent with protection of historic and cultural properties under 36 CFR 800. After applying the Advisory Council on Historic Preservation's criteria of adverse effect (36 CFR 800.5), the National Park Service determined that the activities proposed in alternative B would have *no adverse effect* to the Wupatki National Monument Visitor Center Complex Historic District.

Conclusion. The preferred alternative would result in a long-term, minor, adverse impact to historic structures and districts. Historic structures would be renovated and some new features added to contributing elements of the historic structures or districts; however, changes that affect the character of the historic structures or districts would be avoided. Because the preferred alternative would have long-term, minor, adverse impacts on historic structures and districts, it would contribute a noticeable impact to the overall cumulative impacts from past, present, and reasonably foreseeable future actions, which would result in long-term, minor, and adverse impacts. There would be no impairment of monument resources or values.

Threatened and Endangered Species and Species of Concern

There are no known threatened or endangered species within the project area. As discussed in the "Affected Environment" section of this document, there are three plant species of concern for which there are historic or recent records (Simpsons plains cactus, Cinder Phacelia, and Whiting indigo bush), and five species of concern known from similar habitat near the monument (Cameron water-parsley, Roundleaf errazurizia, Fickeisen plains cactus, Welsh phacelia, and Parish alkali grass). In addition, the monument staff identified six species of concern that were targeted during the 2005 rare plant survey along the road corridor (Simpson hedgehog cactus, Navajo pincushion cactus, sentry milkvetch, largeleaf spring parsley, roundleaf dunebroom, and Peeble's bluestar) (NPS 2005c). The actual newly disturbed area is small since much of the proposed project disturbance would occur within previously disturbed areas. New disturbance of approximately 0.2 acre would occur for the expansion of the Wupatki Visitor Center parking area and an estimated 0.1 acre of new disturbance for the new Painted Desert scenic overlook parking area. The visitor center parking area, although undisturbed, is in an area of heavy pedestrian traffic and it is unlikely these species exist in this area. The new disturbance areas, as well as the road corridor, would be surveyed prior to disturbance to determine if any of these species are present and require special mitigation such as relocation. Impacts to vegetation species of concern would be short and long term, negligible, and adverse.

Three animal species of concern are known to occur within the monument (Wupatki pocket mouse, spotted bat, and pale Townsend's big-eared bat). Two bird species are known from similar habitat near the monument (ferruginous hawk and Western burrowing owl). There are no caves that would be disturbed by the construction work and no night time work is proposed for this project that would affect the feeding habits of the bats. Both the ferruginous hawk and burrowing owl could be transient to the project, but it is unlikely they would be nesting within the project area, which is confined to the road corridor and associated parking areas where human activity levels are high. Of these species, the one with the most potential for impacts from project activities is the Wupatki pocket mouse. Project activities could temporarily displace the Wupatki pocket mouse and, although unlikely, some deaths could result from construction equipment or materials movement. Impacts to species of concern from these projects would be localized, short term, negligible, and adverse due to construction activities. Over the long term, construction activities would cease and construction equipment would be removed. Areas that could be reclaimed would be reclaimed. The displaced species of concern would return to the construction areas and reclaimed site and there would be no long-term impacts.

Although not formally listed as a species of concern, the pronghorn antelope and golden eagle have been identified by monument staff as species of concern. Both species are sensitive to human activity. Visitor activities associated with the road corridor may be impacting antelope presence in the habitat adjacent to the road corridor. Antelope presence adjacent to the corridor decreases during high visitation months; however, such decrease may be due not only to increased human activity, but also to lack of available water. Since most of the road construction would occur during the highest visitation months, from late spring through fall, antelope presence along the road corridor would already be greatly reduced and there would be negligible, short-term, adverse impacts to pronghorn antelope. Recommendations for eradication of turnouts in high antelope activity areas would be followed in the road rehabilitation project design. All existing informal gravel turnouts along the road would be eliminated. Existing parking areas would not be eliminated, but the ability for visitors to stop along the road would be reduced. The long-term impacts to pronghorn antelope from the road rehabilitation work would be minor and beneficial.

Golden eagle nesting generally occurs from December through June, and project activities in the vicinity of Citadel Pueblo would be timed to avoid the nesting period and potential impacts to golden

eagles from construction noise and human activity. Short-term impacts to the golden eagle would be negligible and adverse. In the long term, a permanent gate would be installed at Citadel Pueblo, along with a median barrier that would prevent vehicles from bypassing the gate. This would be a long-term, minor, beneficial impact to nesting golden eagles.

Overall impacts to plant species of concern from implementation of the preferred alternative would be short and long term, negligible, and adverse. Impacts to animal species of concern from these projects would be localized, short term, negligible, and adverse due to construction activities. Long-term impacts to animal species of concern range from no long-term impacts to the Wupatki pocket mouse, ferruginous hawk, and Western burrowing owl; to long-term, minor, beneficial impacts to the pronghorn antelope and golden eagle.

Cumulative Impacts. Past, present, and reasonably foreseeable future projects with the potential to affect biotic species of concern include the phase 1 resurfacing of Route 10, the last phase of improvements to U.S. 89, the removal of housing at New Heiser, and improvements to monument sewerlines. These cumulative actions would have the potential to temporarily disrupt native habitats affecting the abundance and diversity of wildlife by changing the capacity of habitats to provide necessary food, shelter, and reproduction sites. Once construction is completed, projects within the monument would have a revegetation component that would reestablish native habitat over the long term. The cumulative impacts to species of concern could result in detectable changes to these species, but such changes would be small and localized. Cumulative effects would be short and long term, minor, and adverse. The preferred alternative would contribute short-term, negligible, adverse impacts to species of concern. There would be no long-term impacts, except to the golden eagle and pronghorn antelope, which would be minor and beneficial. The overall cumulative impacts from past, present, and reasonably foreseeable future actions, including the preferred alternative, would be short term, negligible to minor, and adverse, and long term, minor, and adverse, except for the golden eagle and pronghorn antelope, where minor beneficial impacts would occur in the long term.

Conclusion. Overall impacts to plant species of concern from implementation of the preferred alternative would be short and long term, negligible, and adverse. Impacts to wildlife species of concern from these projects would be localized, short term, negligible, and adverse due to construction activities. Long-term impacts to animal species of concern range from no long-term impacts to the Wupatki pocket mouse, ferruginous hawk, and Western burrowing owl, to long-term, minor, beneficial impacts to the pronghorn antelope and golden eagle as a result of elimination of the ability for visitors to stop along the road. The overall cumulative impacts from past, present, and reasonably foreseeable future actions, including the preferred alternative, would be short term, negligible to minor, and adverse, and long term, minor, and adverse, except for the golden eagle and pronghorn antelope, where minor beneficial impacts would occur in the long term. There would be no impairment of the monument resources or values.

Visitor Experience

During construction, visitors would experience some delays while traveling on Route 10 and delays or the inability to park in certain turnouts. Mitigation requires, however, that the delays be limited to 15 minutes, Monday to Friday from 7:30 a.m. to 9:00 a.m. and from 4:30 p.m. to 6:00 p.m., and a maximum of 30 minutes any other time. Visitors would not be able to access certain parking areas during closure—this would mean they would not be able to view certain resources of the monument if the parking area is closed. Since the monument is typically not a multiday experience for most visitors, part of the Wupatki experience would be missed. Most visitors would be aware of the road and parking area closures, and since the monument is primarily viewed through travel on Route 10, short-term impacts would be moderate and adverse in nature.

Upon completion of the preferred alternative, the repaired road surface and improved drainage control, parking areas, and turnouts would enhance driving conditions. Although it is not anticipated that the road condition would have any impact on visitation numbers, the driving experience would be improved for visitors traveling on Route 10. The reconstruction would affect all visitors who use the road; however, the reconstruction would likely be detectable only to those visitors familiar with the previous road conditions. The rehabilitation and improvements to parking areas would benefit visitors by providing improved traffic circulation and safety. The overall visitor experience would be improved, most visitors would be aware of the changes and respond favorably to them, resulting in a long-term, moderate, beneficial effect.

Overall effects to visitor use and experience from the preferred alternative would be short term, moderate, and adverse, and long term, moderate, and beneficial.

Cumulative Impacts. Past, present, and reasonably foreseeable future projects with the potential to affect visitor use and experience include the rehabilitation of the Wupatki Visitor Center, the phase 1 resurfacing of Route 10, the last phase of improvements to U.S. 89, and improvements to monument sewerlines. 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 to some, but not all visitors. These activities would have short-term, minor, adverse impacts on visitor experience for the duration of construction activities.

Over the long term, visitor use and experience would be improved by the cumulative projects. Improvements associated with each of these projects (e.g., rehabilitated road surfaces, improved infrastructure, and new or rehabilitated facilities) would improve the overall visitor use and experience for those areas and the improvements would be apparent to some visitors. The improvements would have long-term, minor, beneficial effects on visitor experience.

The preferred alternative would contribute short-term, noticeable, adverse, and long-term, noticeable, beneficial impacts to visitor use and experience. The overall impacts from past, present, and reasonably foreseeable future activities, in association with the preferred alternative, would be short term, minor to moderate, and adverse, and long term, minor to moderate, and beneficial.

Conclusion. Overall effects to visitor use and experience from the preferred alternative would be short term, moderate, and adverse as a result of potential delays during construction, and long term, moderate, and beneficial as a result of the improved driving surface and improved parking areas. The overall impacts from past, present, and reasonably foreseeable future activities, in association with the preferred alternative, would be short term, minor to moderate, and adverse, and long term, minor to moderate, and beneficial.

Monument Neighbors and Other Agencies

During construction, monument neighbors and other agencies would experience delays traveling on Route 10. Mitigation requires, however, that the delays be limited to 15 minutes, Monday through Friday from 7:30 a.m. to 9:00 a.m. and from 4:30 p.m. to 6:00 p.m., and a maximum of 30 minutes any other time. Monument neighbors and other agencies use the road on a regular basis and would be well aware of the road construction activities and travel delays. Monument neighbors and other agencies commuting through the monument would not be affected by parking area closures as monument neighbors and other agencies primarily use Route 10 for commuting and are not likely to stop in the parking areas. However,

American Indian monument neighbors and other agencies use the parking areas for access to ethnographic resources and this parking would be unavailable during the rehabilitation work. Short-term construction-related impacts to monument neighbors and other agencies would be moderate and adverse in nature.

Upon completion of the preferred alternative, the repaired road surface and improved drainage control, parking areas, and turnouts would improve driving conditions. The reconstruction would affect all monument neighbors and other agencies who use the road; most would be aware of the improvements and likely express positive opinions about the road conditions. The preferred alternative would result in long-term, moderate, beneficial impacts on monument neighbors and other agencies.

Cumulative Impacts. Past, present, and reasonably foreseeable future projects with the potential to affect monument neighbors and other agencies include the phase 1 resurfacing of Route 10 and the last phase of improvements to U.S. 89. The short-term effects to monument neighbors and other agencies would be related to construction noise, the presence of construction equipment, and construction-related traffic delays or closures. The cumulative projects would be spread throughout the monument area and would not occur at the same time. However, monument neighbors and other agencies would be aware of all of the projects. These activities would have short-term, moderate, adverse impacts on visitor experience for the duration of construction activities.

Over the long term, monument neighbor access would be improved by the projects. Improvements associated with each of these projects (e.g., rehabilitated road surfaces, improved access to U.S. 89) would facilitate travel for monument neighbors and other agencies. The improvements would have long-term, minor, beneficial effects on monument neighbors and other agencies.

The preferred alternative would contribute short-term, noticeable, adverse impacts to monument neighbors and other agencies, and long-term, noticeable, beneficial impacts. Overall impacts from past, present, and reasonably foreseeable future activities, in association with the preferred alternative, would be short term, moderate, and adverse, and long term, moderate, and beneficial.

Conclusion. Short-term construction-related impacts to monument neighbors and other agencies would be moderate and adverse in nature due to the potential for delays during construction and the potential inability of American Indians to access ethnographic sites. The completion of the preferred alternative would result in long-term, moderate, beneficial impacts to monument neighbors and other agencies as a result of the improved driving conditions. Overall impacts from past, present, and reasonably foreseeable future activities, in association with the preferred alternative, would be short term, moderate, and adverse, and long term, moderate, and beneficial.

Monument Operations

Under the preferred alternative, the road improvements for Route 10 would result in changes to ongoing monument operations. Lower ongoing maintenance costs would be expected with the rehabilitation of the road and the improvements to drainage control and road shoulders for previously rehabilitated road segments. The preferred alternative would eliminate the need for frequent routine maintenance and would require less emergency maintenance to repair failed road segments as a result of the poorly compacted shoulders or drainage problems. The preferred alternative would also result in less impacts to monument operations as a result of the need for traffic controls at the visitor center parking area. On busy days, monument staff typically spend time directing traffic and ensuring that buses do not unload passengers within the traffic circle, blocking vehicles and causing visitors to try to exit the parking area against the flow of traffic. In addition, with the improvements in parking area closure for Citadel

Pueblo, less staff time would be spent in erecting the temporary barriers and patrolling the area for visitors that have driven around the temporary barriers. Implemenation of the preferred alternative would result in minor to moderate, long-term, beneficial impacts to monument operations.

Normal monument operations would continue throughout the duration of the project. Construction activities would occur during the busy season; however, the work is expected to occur during daylight hours. The traffic delays could affect monument staff working and living at the Wupatki Visitor Center residential area while trying to drive through the construction zone; such impacts are expected to be short term, negligible, and adverse.

Cumulative Impacts. Past, present, and reasonably foreseeable future projects with the potential to affect monument operations include the phase 1 resurfacing of Route 10, the removal of housing at New Heiser, and improvements to monument sewerlines. Monument maintenance operations would be reduced by the phase I improvements to Route 10, as well as the improvements to the sewerlines. Monument staff would spend less time on repairs to the existing sewer system and road system. Long-term impacts to monument operations would be minor and beneficial. Monument operations could be negatively impacted in the short term by the sewerline improvements and removal of housing at New Heiser, depending on the amount of staff time required for oversight or actual labor to complete these improvements. Short-term impacts to monument operations would be minor and adverse, depending on the staff time required for these projects.

The preferred alternative would contribute short-term, detectable, adverse, and long-term, noticeable, beneficial impacts to monument operations. Overall cumulative impacts to monument operations from past, present, and reasonably foreseeable future projects would be short term, negligible to minor, and adverse, and long term, minor to moderate, and beneficial.

Conclusion. Implemenation of the preferred alternative would result in short-term, negligible, adverse impacts as park staff experience traffic delays as a result of the construction, and long-term, minor to moderate, beneficial impacts to monument operations as maintenance requirements would decrease and park staff would no longer be needed to direct traffic. Overall cumulative impacts to monument operations from past, present, and reasonably foreseeable future projects would be short term, negligible to minor, and adverse, and long term, minor to moderate, and beneficial.

CONSULTATION AND COORDINATION

SCOPING

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

Staff of Flagstaff Area National Monuments, the Federal Highway Administration, and resource compliance 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 the monument.

A press release initiating scoping and describing the proposed action was issued on May 31, 2005 (appendix A). No comments were received to date. The public and American Indian groups traditionally associated with the lands of Wupatki will also have an opportunity to review and comment on this EA.

The USFS owns portions of the land that Route 10 crosses. Through a cooperative agreement with the USFS, the National Park Service is responsible for maintaining the road. Flagstaff Area National Monuments staff have been in consultation with the USFS on the proposed road rehabilitation.

The National Historic Preservation Act, as amended (16 USC 470 *et seq.*), NEPA, National Park Service Organic Act, NPS *Management Policies* (2001), Director's Order – 12: *Conservation Planning, Environmental Impact Analysis, and Decision-making* (2001), and Director's Order – 28: *Cultural Resources Management Guideline* require the consideration of impacts on cultural resources, either listed in or eligible to be listed in, the NRHP. The National Park Service has contacted the Arizona SHPO and discussed the proposed rehabilitation of the road and parking areas. This EA will be forwarded to the Arizona SHPO for review and comment.

COMPLIANCE WITH FEDERAL AND STATE REGULATIONS

For the no-action alternative, no permits would be required.

For the preferred alternative, the contractor would be responsible for any necessary air quality and stormwater control permits required for the construction activities. The Federal Highway Administration would be responsible for any required permits through the U.S. Army Corps of Engineers.

Other agencies and organizations contacted for information, or that assisted in identifying important issues, developing alternatives, or that will be given an opportunity to review and comment on this EA, include the following:

Federal Agencies

Advisory Council on Historic Preservation
Federal Highway Administration
Natural Resources Conservation Service
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service
U.S. Forest Service
U.S. Geological Survey

State and Local Agencies and Individuals of Arizona

Arizona Department of Environmental Quality
Arizona Department of Game and Fish
Arizona Department of Transportation
Arizona Department of Water Resources
Arizona State Historic Preservation Office
Arizona State Land Department
City of Flagstaff
Coconino County
Doney Park Area Plan Committee
Doney Park Water

American Indian Tribes, Organizations, and Individuals

Havasupai Tribe
Hopi Tribe
Hualapai Tribe
Kaibab Paiute Tribe
Navajo Nation
San Juan Southern Paiute Tribe
Tonto Apache Tribe
White Mountain Apache Tribe
Yavapai – Apache Nation
Yavapai Prescott Indian Tribe
Zuni Heritage and Historic Preservation

Other Groups and Organizations

Senator John Kyle
Senator John McCain
Congressman Rick Renzi
Arizona Archeological Society
Arizona Public Service
Arizona State University
Arizona Wildlife Federation

Colorado Plateau Forum
Diablo Trust
Flagstaff Hiking Club
Flagstaff Mountain Guides
Flagstaff Public Library
Forest Guardians
Friends of Walnut Canyon
Grand Canyon Forest Partnership
Grand Canyon Trust
Grand Canyon Wildlands Council
Museum of Northern Arizona
National Parks and Conservation Association
Northern Arizona Audubon Society
Northern Arizona Cattle Growers
Northern Arizona Council of Governments
Northern Arizona Flyctachers
Northern Arizona University
Rocky Mountain Elk Foundation
Sierra Club
Southwest Forest Alliance
The Nature Conservancy
The Wilderness Society
The Wildlife Society
Trust for Public Land

LIST OF PREPARERS

This EA was prepared by engineering-environmental Management, Inc., under the direction of the National Park Service. Denver Service Center and Wupatki National Monument staff provided invaluable assistance in the development and technical review of this document. National Park Service staff that provided information include:

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Bob Van Belle, Management Assistant
Mike Schneegas, Facility Manager
Kim Watson, Former Chief Ranger
Todd Metzger, Chief, Resource Management
Al Remley, Archeologist
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Steve Mitchelson, Natural Resource Specialist

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Schelle Frye, NEPA and Natural Resource Support

In addition, valuable information on the proposed design was provided by Federal Highway Administration staff and their consultants, Parsons Brinckerhoff.

Brooke Rosener, Federal Highway Administration
Jeff Wilson, Parsons Brinckerhoff
Ben Wardell, Parsons Brinckerhoff

REFERENCES

Anderson

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engineering-environmental Management, Inc. (e^2M)

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Meredith Wilson and Deidre Morgan

2005 Continued Archeological Survey of FR 545 Road Rehabilitation Project Right-of-Way, Draft Report. February 2005.

National Park Service (NPS)

2001 Environmental Assessment / Assessment of Effect, Correct Unsafe Storage Facilities (Heiser Quonset and Maintenance Storage Removal). May 2001.

2002a *Final Environmental Impact Statement and General Management Plan, Wupatki National Monument.*

2002b *Final Environmental Impact Statement and General Management Plan; Sunset Crater Volcano National Monument.*

2003 PMIS 59728, Resurface Wupatki – Sunset Crater Loop Road, Route 010, Wupatki National Monument. Updated 7/21/03.

2004 Personal communication from Flagstaff Area National Monuments superintendent (Palma Wilson) during site visit meeting.

2005a Web site accessed at www.nps.gov/wupa/pphtml/nature.html.

2005b Consensus Determination of Eligibility for Wupatki National Monument Visitor Center Complex Historic District. National Park Service. Flagstaff Area National Monuments, Coconino County, AZ.

2005c Roadside Rare Plant Survey, Draft. August 2005

2005d Pronghorn (*Antilocapra americana*) and Golden Eagle (*Aquila chrysaetos*) Monitoring Relative to the Wupatki – Sunset Loop Road in Wupatki National Monument, January 2005

APPENDIX A

NATIONAL PARK SERVICE PRESS RELEASE

For Immediate Release
May 31, 2005 Contact: Bob Van Belle (928) 526-1157 (X275)

Flagstaff Area National Monuments Plan to Resurface and Improve Wupatki – Sunset Crater Scenic Loop Road and Related Facilities

Flagstaff, AZ — Superintendent Palma Wilson announced that the National Park Service, Flagstaff Area National Monuments, propose to resurface the Wupatki – Sunset Crater Scenic Loop Road, also known as Forest Road 545. This 27 mile scenic loop is the primary, paved access road for Wupatki and Sunset Crater National Monuments, as well as large areas of adjacent lands managed by the Coconino National Forest, included the Strawberry Crater Wilderness Area and the Cinder Hills ORV Area.

The proposal includes paving and improving heavily-used turnouts and viewpoints such as the Painted Desert Overlook; design improvements of the parking lot and picnic benches at the Wupatki Visitor Center (including improved universal access for people with disabilities); removal and/or relocation of several unsafe, unpaved turnouts along sections of the road; improvements at the Doney Picnic Area including new picnic tables, additional split-rail fencing, paved walkways for enhanced universal/disabled access, and upgraded RV parking. Modifications at the Citadel Pueblo parking area include improved universal/disabled access to Nalakihu Pueblo, installation of a parking median and parking stalls, and new gates designed to provide a safe and effective means to enact the annual closure of the site during the Golden Eagle nesting season.

This project is being funded through the Federal Highway Administration. The Wupatki – Sunset Crater Scenic Loop Road was initially paved in the 1950's to provide better access to the then-remote National Monuments. It now serves as an important access road for the rural residential areas adjacent to the two National Monuments, as well as residents of the Navajo Nation.

Wilson said that construction may begin in 2007 and take up to one year to complete. Both Parks will remain open during construction. The public is invited to direct concerns or comments regarding this project to Superintendent Wilson at (928) 526-1157, or by sending an email to palma_wilson@nps.gov, or by writing her at Flagstaff Area National Monuments, 6400 N. Highway 89, Flagstaff AZ 86004.

# # #

APPENDIX B

CORRESPONDENCE WITH U.S. FISH AND WILDLIFE SERVICE AND SPECIES LISTS

United States Department of the Interior
NATIONAL PARK SERVICE
DENVER SERVICE CENTER
12795 W. ALAMEDA PARKWAY
P.O. BOX 25287
DENVER, COLORADO 80225-0287

IN REPLY REFER TO

TAKE PRIDE IN AMERICA

N1621 (DSC-T)
WUPA-59728

AUG 2 0 2004

Dr, Steve Spangle, Field Supervisor
United States Fish & Wildlife Service
Arizona Ecological Services
2321 W. Royal Palm Rd., Suite 103
Phoenix, AZ 85021

Dear Dr. Spangle:

Reference: Wupatki National Monument, Rehabilitate Approximately 16 Miles of Route 10 (FS 545), PMIS # 59728

Subject: List of Federally Listed Threatened and Endangered Species

The National Park Service (NPS) is initiating a road rehabilitation project at Wupatki National Monument, Flagstaff, AZ. The primary focus of this project is to rehabilitate approximately 16 miles of Route 10 (FS 545), the primary park road surface beginning at the south boundary of Wupatki National Monument and ending at the northern junction with US 89. An additional 5 miles of route 10 between Sunset Crater and Wupatki may also be improved if funds are available within the current program amount

As the Natural Resource Specialist assigned to this project, I am requesting a current list of federally listed or candidate threatened or endangered species, any other special status species that might occur in the locality mentioned above, and designated critical habitats, if any, for these species.

In order to meet project schedules, I would appreciate your response sent to me at the address above by September 14, 2004. If you have any questions or comments I can be reached by phone at 303/969-2252 or e-mail at steve_stone@nps.gov.

This letter will serve as a record that the NPS is initiating informal consultation with your agency pursuant to the requirements of the Endangered Species Act and NPS *Management Policies* (2001).

We appreciate your continuing assistance with National Park Service projects.

Sincerely,

Stephen E. Stone

Stephen E. Stone

cc:
WUPA.-DeYoung

United States Department of the Interior
U.S. Fish and Wildlife Service
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
02-21-04-I-0396

August 25, 2004

Memorandum

To: Natural Resource Specialist, National Park Service, Denver, Colorado
(Attn: Stephen E. Stone)

From: Field Supervisor

Subject: Wupatki National Monument-
Rehabilitation of Approximately 16 Miles of Route 10

Thank you for your recent request for information on threatened or endangered species, or those that are proposed to be listed as such under the Endangered Species Act of 1973, as amended (Act), which may occur in your project area. The Arizona Ecological Service Field Office has posted lists of the endangered, threatened, proposed, and candidate species occurring in each of Arizona's 15 counties on the Internet. Please refer to the following web page for species information in the county where your project occurs: **http://arizonaes.fws.gov**

If you do not have access to the Internet or have difficulty obtaining a list, please contact our office and we will mail or fax you a list as soon as possible.

After opening the web page, find County Species Lists on the main page. Then click on the county of interest. The arrows on the left will guide you through information on species that are listed, proposed, candidates, or have conservation agreements. Here you will find information on the species' status, a physical description, all counties where the species occurs, habitat, elevation, and some general comments. Additional information can be obtained by going back to the main page. On the left side of the screen, click on Document Library, then click on Documents by Species, then click on the name of the species of interest to obtain General Species Information, or other documents that may be available. Click on the cactus icon to view the desired document.

Please note that your project area may not necessarily include all or any of the species in a list. The information provided includes general descriptions, habitat requirements, and other information for each species on the list. Under the General Species Information, citations for the Federal Register (FR) are included for each listed and proposed species. The FR is available at most public libraries. This information should assist you in determining which species may or may not occur within your project area. Site-specific surveys could also be helpful and may be needed to verify the presence or absence of a species or its habitat as required for the evaluation of proposed project-related impacts.

Endangered and threatened 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 adversely affected by a federally funded, permitted, or authorized activity, the action agency will need to request formal consultation with us. If the action agency determines that the planned action may jeopardize a proposed species or destroy or adversely modify proposed critical habitat, the action agency will need to enter into a section 7 conference. The county list may also contain candidate species. Candidate species 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 that they become listed or proposed for listing prior to project completion.

If any proposed action occurs in or near areas with trees and shrubs growing along watercourses, known as riparian habitat, we recommend the protection of these areas. Riparian areas are critical to biological community diversity and provide linear corridors important to migratory species. In addition, if the project will result in the deposition of dredged or fill materials into waterways, we recommend you contact the Army Corps of Engineers which regulates these activities under Section 404 of the Clean Water Act.

The State of Arizona and some of the Native American Tribes protect some plant and animal species not protected by Federal law. We recommend you contact the Arizona Game and Fish Department and the Arizona Department of Agriculture for State-listed or sensitive species, or contact the appropriate Native American Tribe to determine if sensitive species are protected by Tribal governments in your project area. We further recommend that you invite the Arizona Game and Fish Department and any Native American Tribes in or near your project area to participate in your informal or formal Section 7 Consultation process.

For additional communications regarding this project, please refer to consultation number 02-21-04-I-0396. We appreciate your efforts to identify and avoid impacts to listed and sensitive species in your project area. If we may be of further assistance, please feel free to contact Brenda Smith (928) 226-0614 (x101) for projects in Northern Arizona, Tom Gatz (602) 242-0210 (x240) for projects in central Arizona and along the Lower Colorado River, and Sherry Barrett (520) 670-6150 (x223) for projects in southern Arizona.

Steven L. Spangle

cc: Bob Broscheid, Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ
Office Manager, Fish and Wildlife Service, Flagstaff, AZ

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County Species Lists-Coconino County

Common Name	Scientific Name	Status	Description	County	Elevation Range	Habitat	Comments
1) Listed							18
Apache (Arizona) trout	*Oncorhynchus apache*	Threatened	This yellowish or yellow-olive cutthroat-like trout has large dark spots on body. Its dorsal, anal, and caudal fins are edged with white. It has no red lateral band.	Apache Coconino Gila Graham Greenlee Navajo	>5000 ft	Presently restricted to cold mountain streams with many low gradient meadow reaches.	Occupies stream habitats with substrates of boulders, rocks, and gravel with some sand or silt through mixed conifer and spruce-fir forests, and montane meadows and grasslands in the White Mountains. Also managed as a sport fish under special regulations. Found in North Canyon on East side of Kaibab Plateau.
Bald eagle	*Haliaeetus leucocephalus*	Threatened	Large, adults have white head and tail. Height 28-38"; wingspan 66-96". 1-4 yrs dark with varying degrees of mottled brown plumage. Feet bare of feathers.	Apache Cochise Coconino Gila Graham La Paz Maricopa Mohave Navajo Pima Pinal Santa Cruz Yavapai Yuma	Varies	Large trees or cliffs near water (reservoirs, rivers, and streams) with abundant prey.	Some birds are nesting residents while a larger number winters along rivers and reservoirs. An estimated 200 to 300 birds winter in Arizona. Once endangered (32 FR 4001, 03-11-1967; 43 FR 6233, 02-14-78) because of reproductive failures from pesticide poisoning and loss of habitat, this species was down listed to threatened on August 11, 1995. Illegal shooting, disturbance, and loss of habitat continues to be a problem. Species has been proposed for delisting (64 FR 36454) but still receives full protection under the ESA.
Black-footed ferret	*Mustela nigripes*	Endangered	Weasel-like, yellow buff coloration with black feet, tail tip, and eye mask. It	Apache Coconino Navajo	<10,500	Grassland plains generally found in association with prairie dogs.	Unsurveyed prarie dog towns may be occupied by ferrets or may be appropriate for future reintroduction efforts. The

			has a blunt light colored nose and is 15-18 inches long and tail length is 5-6 inches.				Service developed guidelines for surveying prairie dog towns which are available upon request. No wild populations of this species are currently known to exist in Arizona.
Brady pincushion cactus	*Pediocactus bradyi*	Endangered	Small, semi-globose cactus, 2.4 inches tall and 2 inches in diameter. Spines are white or yellowish-tan. The spine clusters 1-2 central spines and 14-15 spreading radial spines. Flower: straw yellow produced at top of the stem.	Coconino	3850-4500 ft	Benches and terraces in Navajo desert near Marble Gorge.	Substrate is Kaibab limestone chips over moenkopi shale and sandstone soil. Plant community dominated by shadscale (Atriplex confertifolia), snakeweek (Guteierrezia sarothrae), mormon tea (Ephedra viridis), and desert trumpet (Eriogonum inflatum). Protected by CITES and Arizona Native Plant Law.
California Brown pelican	*Pelecanus occidentalis californicus*	Endangered	Large dark gray-brown water bird with a pouch underneath long bill and webbed feet. Adults have a white head and neck, brownish black breast, and silver gray upper parts.	Apache Cochise Coconino Gila Graham Greenlee La Paz Maricopa Mohave Navajo Pima Pinal Santa Cruz Yavapai Yuma	Varies	Coastal land and islands; species found around many Arizona lakes and rivers	Subspecies is found on Pacific Coast and is endangered due to pesticides. It is an uncommon transient in Arizona on many Arizona lakes and rivers. Individuals wander up from Mexico in summer and fall. No breeding records in Arizona.
California condor	*Gymnogyps californianus*	Endangered	Very large vulture (47 in., wingspan to 9 1/2 ft, weight to 22 lbs); adult plumage blackish, immature more brownish; adult wing linings white, immature mottled; head and	Apache Coconino Mohave Navajo	Varies	High desert canyonlands and plateaus	Last wild condor reported in Arizona in 1924. Recovery program has reintroduced condors to Northern Arizona, with the first release (6 birds) in December 1996. Release site located at the Vermillion Cliffs (Coconino County), with an experimental/nonessential area

			upper parts of neck bare; yellow-orange in adults, grayish in mature.				designated for most of Northern Arizona and Southern Utah. Experimental/nonessential area in Arizona is within a polygon formed by Hwy 191, Interstate 40, and Hwy 93, and extends north of the Arizona-Utah and Nevada borders.
Chiricahua leopard frog	*Rana chiricahuensis*	Threatened	Cream colored tubercules (spots) on a dark background on the rear of the thigh, dorsolateral folds that are interrupted and deflected medially, and a call given out of water distinguish this spotted frog from other leopard frogs.	Apache Cochise Coconino Gila Graham Greenlee Navajo Pima Santa Cruz Yavapai	3300-8900 ft	Streams, rivers, backwaters, ponds, and stock tanks that are mostly free from introduced fish, crayfish, and bullfrogs	Require permanent or nearly permanent water sources. Populations north of the Gila River may be closely-related, but distinct, undescribed species. A special rule allows take of frogs due to operation and maintenance of livestock tanks on State and private lands.
Humpback chub	*Gila cypha*	Endangered	Large (18 inches) minnow flattened head long fleshy snout, large fins, and a very large hump between the head and the dorsal fin.	Coconino Mohave	< 4, 000 ft	Large warm turbid rivers especially canyon areas with deep fast water.	Critical habitat in Grand Canyon.
Kanab ambersnail	*Oxyloma haydeni kanabensis*	Endangered	Small 14-19 mm (<0.7 inch), light amber color, sometimes grayish-amber mottled; right handed shell.	Coconino	2,900 ft	Travertine seeps and springs in Grand Canyon National Park	Extremely geographically isolated. Three historic populations; two remaining; one on private property in Utah and one in Grand Canyon National Park; species affected by operations by Glen Canyon Dam. Associated with watercress, monkey flower, and other wetland vegetation.
Little Colorado spinedace	*Lepidomeda vittata*	Threatened	Small (<4 inches long) silvery minnow which is darker on the back than the	Apache Coconino Navajo	4000-8000 ft	Moderate to small streams in pools and riffles with water flowing over	Critical habitat includes eighteen miles of East Clear Creek, eight miles of Chevelon Creek, and five miles of Nutrioso Creek.

			belly.			gravel and silt.	
Mexican spotted owl	*Strix occidentalis lucida*	Threatened	Medium sized with dark eyes and no ear tufts. Brownish and heavily spotted with white or beige.	Apache Cochise Coconino Gila Graham Greenlee Maricopa Mohave Navajo Pima Pinal Santa Cruz Yavapai	4,100-9,000 ft	Nests in canyons and dense forests with multi-layered foliage structure.	Generally nests in older forests of mixed conifer or ponderosa pine/gambel oak type, in canyons, and use variety of habitats for foraging. Sites with cool microclimates appear to be of importance or are preferred. Critical habitat was finalized on August 31, 2004 (69 FR 53182). Critical habitat in Arizona occurs in Apache, Cochise, Coconino, Gila, Graham, Greenlee, Maricopa, Navajo, Pima, Pinal, Santa Cruz, and Yavapai counties.
Navajo sedge	*Carex specuicola*	Threatened	Perennial forb with triangular stems, elongated rhizomes. Flower: white June and July.	Apache Coconino Navajo	5700-6000 ft	Silty soils at shady seeps and springs.	Designated critical habitat is on the Navajo Nation near Inscription House Ruins. Found at seep springs on vertical cliffs of pink-red Navajo sandstone.
Razorback sucker	*Xyrauchen texanus*	Endangered	Large (up to 3 feet long and up to 6 lbs, high sharp-edged keel-like hump behind the head. Head flattened on top. Olive-brown above to yellowish below.	Coconino Gila Graham Greenlee La Paz Maricopa Mohave Pinal Yavapai Yuma	< 6000 ft	Riverine and lacustrine areas, generally not in fast moving water and may use backwaters.	Species is also found in Horseshoe reservoir (Maricopa County). Critical habitat includes the 100-year floodplain of the river through the Grand Canyon from confluence with Paria River to Hoover Dam; Hoover Dam to Davis Dam; Parker Dam to Imperial Dam. Also Gila River from Arizon/New Mexico border to Coolidge Dam; and Salt River from Hwy 60/SR77 Bridge to Roosevelt Dam; Verde River from FS boundary to Horseshoe Lake.
San Francisco Peaks groundsel	*Senecio franciscanus*	Threatened	Member of sunflower family, dwarf alpine species 1.2-4 inches tall. Leaves deeply lobed. Flowers: 0.5 inch diameter 1-6	Coconino	10900+ ft	Alpine tundra	Designated critical habitat is San Francisco Peaks. Found above spruce-fir and pine forests on talus slopes.

			yellow-gold flowers.				
Sentry milk vetch	*Astragalus cremnophylax var. cremnophylax*	Endangered	< 1 inch high forming a mat 1-10 inches in diameter. Flowers: pale purple April to May.	Coconino	>4,000 ft	Pinyon-juniper-cliffrose on a white layer of limestone.	Grows on Kaibab limestone with little soil in an unshaded opening in pinyon-juniper. Possibly more populations to be found on south rim of Grand Canyon and east rim of Marble Gorge.
Siler pincushion cactus	*Pediocactus sileri*	Threatened	Small solitary or clustered cactus globose shaped about 5 inches tall and 3-4 inches in diameter. Flowers: yellow with maroon veins.	Coconino Mohave	2,800-5,400 ft	Desertscrub transitional areas of Navajo, sagebrush and Mohave Deserts	Grows on gypsiferous clay and sandy soils of moenkopi formation.
Southwestern willow flycatcher	*Empidonax traillii extimus*	Endangered	Small passerine (about 6 inches) grayish-green back and wings, whitish throat, light olive-gray breast and pale yellowish belly. Two wingbars visible. Eye-ring faint or absent.	Apache Cochise Coconino Gila Graham Greenlee La Paz Maricopa Mohave Navajo Pima Pinal Santa Cruz Yavapai Yuma	<8500 ft	Cottonwood/willow and tamarisk vegetation communities along rivers and streams.	Migratory riparian obligate species that occupies breeding habitat from late April to September. Distribution within its range is restricted to riparian corridors. Difficult to distinguish from other members of the Empidonax complex by sight alone. Training seminar required for those conducting flycatcher surveys. Critical habitat was proposed on October 12, 2004 (50 CFR 60706, October 12, 2004) and can be viewed at http://arizonaes.fws.gov. In Arizona there are critical habitat segments proposed in Apache, Cochise, Gila, Graham, Greenlee, La Paz, Maricopa, Mohave, Pima, Pinal, Yavapai, and Yuma counties.
Welsh's milkweed	*Asclepias welshii*	Threatened	Milkweed family (Asclepiadaceae), rhizomatous, herbaceous perennial, 10-40 inches tall with large oval leaves.	Coconino	VARIES	Open stabilized desertscrub dunes and lee side of active dunes.	Designated critical habitat is in Utah.

			Flowers: cream colored, rose tinged in center.					

2) Proposed

1

Gila chub	*Gila intermedia*	Proposed Endangered	Deep compressed body, flat head. Dark olive-gray color above, silver sides. Endemic to Gila River Basin.	Cochise Coconino Gila Graham Greenlee Maricopa Pima Pinal Santa Cruz Yavapai	2000 - 3500 ft	Pools, springs, cienegas, and streams.	Multiple private landowners, including the Nature Conervancy, the Audubon Society, and others. Also Fort Huachuca. Species also found in Sonora, Mexico. Proposed critical habitat occurs in Cochise, Gila, Graham, Greenlee, Pima, Pinal, Santa Cruz and Yavapai counties.

3) Candidate

2

Fickeisen plains cactus	*Pediocactus peeblesianus var. fickeiseniae*	Candidate	Very small (3 inches tall - 1.5 inches diameter) unbranched cactus that retreats into gravely soils after flowering and fruiting. Tubercles form a spiral pattern around plant. Central spine 3/8 inch long flowers cream/yellow.	Coconino Mohave	4,000-5,000 ft	Exposed layers of Kaibab limestone on canyon margins or hills of Navajoan Desert.	
Yellow-billed cuckoo	*Coccyzus americanus*	Candidate	Medium sized bird with a slender, long-tailed profile, slightly down-curved bill, which is blue-black with yellow on the lower half of the bill. Plumage is grayish-brown above and white below, with rufous primary flight feathers.	Apache Cochise Coconino Gila Graham Greenlee La Paz Maricopa Mohave Navajo Pima Pinal Santa	< 6,500 ft	Large blocks of riparain woodlands (Cottonwood, willow, or tamarisk galleries).	Species was found warranted, but precluded for listing as a distinct vertebrate population segment in the western U.S. on July 25, 2001. This finding indicates that the Service has sufficient information to list the bird, but other, higher priority listing actions prevent the Service from addressing the listing of the cuckoo at this time.

Cruz
Yavapai
Yuma

4) Conservation Agreement

2

Arizona bugbane	*Cimicifuga arizonica*	Conservation Agreement	Perennial herb in the buttercup family up to 6-7 feet tall. Small white petal-less flowers appear in July-August. Fruit a follicle that splits open on one side as it dries.	Coconino Gila	5,300-7,000 ft	Moist, loamy soil between coniferous and riparian ecotones.	Rich, fertile soils high in humus content, deep shade, and high humidity appears to be primary habitat requirements for this speices. Conservation Agreement signed in June 1999.
Paradine (Kaibab) plains cactus	*Pediocactus paradinei*	Conservation Agreement	Small, green, globose cactus; usually less than 40 mm tall with half of its stem underground. Plant diameters can reach 60-80 mm. 4-6 spines per aereole; flowers are 19-25 mm with cream to pale yellow petals and pink midrib.	Coconino	>4,500 ft	Pinyon-juniper woodland, and shrub/grassland	Species also called Paradine Plains Cactus. Conservation Agreement between the Service, Kaibab National Forest, and the Bureau of Land Management finalized in October 1996; signed in February 1998.

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Status Definitions

Federal U.S. Status

ESA Endangered Species Act (1973 as amended)
US Department of Interior, Fish and Wildlife Service

Listed

LE	Listed Endangered: Imminent jeopardy of extinction.
LT	Listed Threatened: imminent jeopardy of becoming Endangered.
XN	Experimental Nonessential population.

Proposed for Listing

PE	Proposed Endangered
PT	Proposed Threatened

Candidate (Notice of Review: 1999)

C	Candidate. Species for which USFWS has sufficient information on biological vulnerability and threats to support proposals to list as Endangered or Threatened under ESA. However, proposed rules have not yet been issued because such actions are precluded at present by other listing activity.
SC	Species of Concern. The terms "Species of Concern" or "Species at Risk" should be considered as terms-of-art that describe the entire realm of taxa whose conservation status may be of concern to the US Fish and Wildlife Service, but neither term has official status (currently all former C2 species).

Critical Habitat (check with state or regional USFWS office for location details)

Y	Yes: Critical Habitat has been designated.
P	Proposed: Critical Habitat has been proposed.

[\N No Status: Certain populations of this taxon do not have designated status (check with state or regional USFWS office for details about which populations have designated status)].

USFS US Forest Service (1999 Animals, 1999 Plants)
US Department of Agriculture, Forest Service, Region 3

S	Sensitive: those taxa occurring on National Forests in Arizona which are considered sensitive by the Regional Forester.

BLM US Bureau of Land Management (2000 Animals, 2000 Plants)
US Department of Interior, BLM, Arizona State Office

S Sensitive: those taxa occurring on BLM Field Office Lands in Arizona which are considered sensitive by the Arizona State Office.

P Population: only those populations of Banded Gila monster (Heloderma suspectum cinctum) that occur north and west of the Colorado River, are considered sensitive by the Arizona State Office.

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Tribal Status

NESL Navajo Endangered Species List (1997)
Navajo Nation, Navajo Fish and Wildlife Department

The Navajo Endangered Species List contains taxa with status from the entire Navajo Nation which includes parts of Arizona, Utah, and New Mexico. In this notebook we provide NESL status for only those taxa whose distribution includes part or all of the Arizona portion of the Navajo Nation.

Groups

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

2 Any species or subspecies which is in danger of being eliminated from all or a significant portion of its range on the Navajo Nation.

3 Any species or subspecies which is likely to become an endangered species, within the foreseeable future, throughout all or a significant portion of its range on the Navajo Nation.

4 Any species or subspecies for which the Navajo Fish and Wildlife Department (NF&WD) does not currently have sufficient information to support their being listed in Group 2 or Group 3 but has reason to consider them. The NF&WD will actively seek information on these species to determine if they warrant inclusion in a different group or removal from the list.

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Mexican Status

MEX Mexican Federal Endangered Species List (May 16, 1994)
Secretaría de Desarollo Social, NORMA Oficial Mexicana NOM-059-ECOL-1994

The Mexican Federal Endangered Species List contains taxa with status from the entire Mexican Republic and waters under its jurisdiction. In this notebook we provide MEX designations for only those taxa occurring in Arizona and also in Mexico.

P En Peligro de Extinción (Determined Endangered in Mexico): in danger of extinction.

A Amenazada (Determined Threatened in Mexico): could become endangered if factors causing habitat deterioration or population decline continue.

R Rara (Determined Rare in Mexico): populations viable but naturally scarce or restricted to an area of reduced distribution or very specific habitats.

Pr Sujeta a Protección Especial (Determined Subject to Special Protection in Mexico): utilization limited due to reduced populations, restricted distribution, or to favor recovery and conservation of the taxon or associated taxa.

[ ]= One or more subspecies of this species has status in Mexico, but the HDMS does not track it at the subspecies level (most of these subspecies are endemic to Mexico). Please consult the NORMA Oficial Mexicana NOM-059-ECOL-1994 for details.]

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State Status

NPL Arizona Native Plant Law (1993)
Arizona Department of Agriculture

HS Highly Safeguarded: no collection allowed.

SR Salvage Restricted: collection only with permit.

ER Export Restricted: transport out of State prohibited.

SA Salvage Assessed: permits required to remove live trees.

HR Harvest Restricted: permits required to remove plant by-products.

WSCA Wildlife of Special Concern in Arizona (1996 in prep)
Arizona Game and Fish Department

WC Wildlife of Special Concern in Arizona. Species whose occurrence in Arizona is or may be in jeopardy, or with known or perceived threats or population declines, as described by the Arizona Game and Fish Department's listing of Wildlife of Special Concern in Arizona (WSCA, in prep). Species indicated on printouts as WC are currently the same as those in Threatened Native Wildlife in Arizona (1988).

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Special Status Species in the Arizona HDMS, listed alphabetically by county, by taxon, by scientific name.

Updated April 2005

COUNTY	TAXON	SCIENTIFIC NAME	COMMON NAME	ESA	BLM	USFS	STATE
Cochise	REPTILE	Thamnophis eques megalops	Northern Mexican Gartersnake	SC		S	WSC
Coconino	AMPHIBIAN	Bufo microscaphus	Arizona Toad	SC		S	
Coconino	AMPHIBIAN	Rana blairi	Plains Leopard Frog				WSC
Coconino	AMPHIBIAN	Rana chiricahuensis	Chiricahua Leopard Frog	LT		S	WSC
Coconino	AMPHIBIAN	Rana pipiens	Northern Leopard Frog			S	WSC
Coconino	AMPHIBIAN	Rana yavapaiensis	Lowland Leopard Frog	SC		S	WSC
Coconino	BIRD	Accipiter gentilis	Northern Goshawk	SC		S	WSC
Coconino	BIRD	Athene cunicularia hypugaea	Western Burrowing Owl	SC	S		
Coconino	BIRD	Buteo regalis	Ferruginous Hawk	SC			WSC
Coconino	BIRD	Buteogallus anthracinus	Common Black-Hawk			S	WSC
Coconino	BIRD	Ceryle alcyon	Belted Kingfisher				WSC
Coconino	BIRD	Empidonax traillii extimus	Southwestern Willow Flycatcher	LE		S	WSC
Coconino	BIRD	Euptilotis neoxenus	Eared Quetzal			S	
Coconino	BIRD	Falco peregrinus anatum	American Peregrine Falcon	SC		S	WSC
Coconino	BIRD	Haliaeetus leucocephalus	Bald Eagle	LT		S	WSC
Coconino	BIRD	Pandion haliaetus	Osprey				WSC
Coconino	BIRD	Pinicola enucleator	Pine Grosbeak				WSC
Coconino	BIRD	Plegadis chihi	White-faced Ibis	SC	S		
Coconino	BIRD	Strix occidentalis lucida	Mexican Spotted Owl	LT		S	WSC
Coconino	FISH	Catostomus clarki	Desert Sucker	SC	S		
Coconino	FISH	Catostomus insignis	Sonora Sucker	SC	S		
Coconino	FISH	Catostomus latipinnis	Flannelmouth Sucker	SC		S	
Coconino	FISH	Catostomus sp. 3	Little Colorado Sucker	SC	S	S	WSC
Coconino	FISH	Gila cypha	Humpback Chub	LE			WSC
Coconino	FISH	Gila intermedia	Gila Chub	PE		S	WSC
Coconino	FISH	Gila robusta	Roundtail Chub	SC		S	WSC
Coconino	FISH	Lepidomeda vittata	Little Colorado Spinedace	LT		S	WSC
Coconino	FISH	Oncorhynchus apache	Apache (Arizona) Trout	LT		S	WSC
Coconino	FISH	Rhinichthys osculus	Speckled Dace	SC	S		
Coconino	FISH	Xyrauchen texanus	Razorback Sucker	LE		S	WSC
Coconino	INVERTEBRATE	Anodonta californiensis	California Floater	SC		S	
Coconino	INVERTEBRATE	Archeolarca cavicola	Grand Canyon Cave Pseudoscorpion	SC			
Coconino	INVERTEBRATE	Cicindela oregona maricopa	Maricopa Tiger Beetle	SC	S	S	

Special Status Species in the Arizona HDMS, listed alphabetically by county, by taxon, by scientific name.

Updated April 2005

COUNTY	TAXON	SCIENTIFIC NAME	COMMON NAME	ESA	BLM	USFS	STATE
Coconino	INVERTEBRATE	Discus shimekii cockerelli	Cockerell's Striate Disc (Snail)	SC	S		
Coconino	INVERTEBRATE	Metrichia nigritta	Page Spring Micro Caddisfly	SC			
Coconino	INVERTEBRATE	Oxyloma haydeni haydeni	Niobrara Ambersnail		S	S	
Coconino	INVERTEBRATE	Oxyloma haydeni kanabensis	Kanab Ambersnail	LE	S	S	
Coconino	INVERTEBRATE	Stenopalmatus navajo	Navajo Jerusalem Cricket	SC	S	S	
Coconino	MAMMAL	Choeronycteris mexicana	Mexican Long-tongued Bat	SC	S		WSC
Coconino	MAMMAL	Corynorhinus townsendii pallescens	Pale Townsend's Big-eared Bat	SC			
Coconino	MAMMAL	Dipodomys microps leucotis	Houserock Valley Chisel-toothed Kangaroo Rat	SC	S		WSC
Coconino	MAMMAL	Euderma maculatum	Spotted Bat	SC	S		WSC
Coconino	MAMMAL	Eumops perotis californicus	Greater Western Bonneted Bat	SC			
Coconino	MAMMAL	Idionycteris phyllotis	Allen's Big-eared Bat	SC	S		
Coconino	MAMMAL	Lasiurus blossevillii	Western Red Bat				WSC
Coconino	MAMMAL	Microtus mexicanus hualpaiensis	Hualapai Mexican Vole	LE			WSC
Coconino	MAMMAL	Microtus mexicanus navaho	Navajo Mexican Vole	SC		S	WSC
Coconino	MAMMAL	Myotis ciliolabrum	Western Small-footed Myotis	SC	S		
Coconino	MAMMAL	Myotis evotis	Long-eared Myotis	SC	S		
Coconino	MAMMAL	Myotis occultus	Arizona Myotis	SC	S		
Coconino	MAMMAL	Myotis thysanodes	Fringed Myotis	SC	S		
Coconino	MAMMAL	Myotis velifer	Cave Myotis	SC	S		
Coconino	MAMMAL	Myotis volans	Long-legged Myotis	SC	S		
Coconino	MAMMAL	Nyctinomops macrotis	Big Free-tailed Bat	SC	S		
Coconino	MAMMAL	Perognathus amplus cineris	Wupatki Arizona Pocket Mouse	SC		S	
Coconino	PLANT	Allium bigelovii	Bigelow Onion				SR
Coconino	PLANT	Amsonia peeblesii	Peebles Blue Star		S		
Coconino	PLANT	Aquilegia desertorum	Mogollon Columbine				SR
Coconino	PLANT	Argemone arizonica	Roaring Springs Prickly-poppy	SC			
Coconino	PLANT	Artemisia pygmaea	Pygmy Sagebrush		S		
Coconino	PLANT	Asclepias welshii	Welsh's Milkweed	LT			HS
Coconino	PLANT	Astragalus ampullarius	Gumbo Milk-vetch	SC		S	
Coconino	PLANT	Astragalus beathii	Beath Milk-vetch		S		
Coconino	PLANT	Astragalus cremnophylax var. cremnophylax	Sentry Milk-vetch	LE			HS
Coconino	PLANT	Astragalus cremnophylax var. hevronii	Marble Canyon Milk-vetch			S	
Coconino	PLANT	Astragalus cremnophylax var. myriorrhaphis	Cliff Milk-vetch	SC	S	S	SR

Special Status Species in the Arizona HDMS, listed alphabetically by county, by taxon, by scientific name.

Updated April 2005

COUNTY	TAXON	SCIENTIFIC NAME	COMMON NAME	ESA	BLM	USFS	STATE
Coconino	PLANT	Astragalus rusbyi	Rusby's Milk-vetch			S	
Coconino	PLANT	Astragalus xiphoides	Gladiator Milk Vetch	SC			SR
Coconino	PLANT	Botrychium crenulatum	Crenulate Moonwort	SC		S	
Coconino	PLANT	Calypso bulbosa	Western Fairy Slipper				SR
Coconino	PLANT	Camissonia exilis	Slender Evening-primrose	SC	S		SR
Coconino	PLANT	Camissonia specuicola ssp. hesperia	Grand Canyon Evening-primrose	SC			
Coconino	PLANT	Carex specuicola	Navajo Sedge	LT			HS
Coconino	PLANT	Castilleja kaibabensis	Kaibab Paintbrush			S	
Coconino	PLANT	Chrysothamnus molestus	Tusayan Rabbitbrush	SC		S	
Coconino	PLANT	Cimicifuga arizonica	Arizona Bugbane	SC		S	HS
Coconino	PLANT	Cirsium parryi ssp. mogollonicum	Mogollon Thistle	SC		S	SR
Coconino	PLANT	Coryphantha missouriensis	Missouri Corycactus				SR
Coconino	PLANT	Cymopterus megacephalus	Cameron Water-parsley	SC		S	
Coconino	PLANT	Echinocactus polycephalus	Cotton-top Cactus				SR
Coconino	PLANT	Erigeron saxatilis	Rock Fleabane			S	
Coconino	PLANT	Eriogonum ericifolium var. ericifolium	Heathleaf Wild-buckwheat			S	
Coconino	PLANT	Eriogonum ripleyi	Ripley Wild-buckwheat	SC		S	SR
Coconino	PLANT	Errazurizia rotundata	Roundleaf Errazurizia		S		SR
Coconino	PLANT	Flaveria mcdougallii	Grand Canyon Flaveria				SR
Coconino	PLANT	Gentianopsis barbellata	Bearded Gentian			S	
Coconino	PLANT	Hedeoma diffusum	Flagstaff Pennyroyal			S	SR
Coconino	PLANT	Heuchera eastwoodiae	Eastwood Alum Root			S	
Coconino	PLANT	Lesquerella kaibabensis	Kaibab Bladderpod	SC		S	
Coconino	PLANT	Listera convallarioides	Broadleaf Twayblade				SR
Coconino	PLANT	Malaxis porphyrea	Purple Adder's Mouth				SR
Coconino	PLANT	Opuntia basilaris var. aurea	Yellow Beavertail				SR
Coconino	PLANT	Opuntia nicholii	Navajo Bridge Cactus				SR
Coconino	PLANT	Pediocactus bradyi	Brady Pincushion Cactus	LE			HS
Coconino	PLANT	Pediocactus paradinei	Kaibab Pincushion Cactus	SC	S	S	HS
Coconino	PLANT	Pediocactus peeblesianus var. fickeiseniae	Fickeisen Plains Cactus	C	S	S	HS
Coconino	PLANT	Pediocactus sileri	Siler Pincushion Cactus	LT			HS
Coconino	PLANT	Pediocactus simpsonii	Simpson Plains Cactus				SR
Coconino	PLANT	Penstemon clutei	Sunset Crater Beardtongue	SC		S	SR

Special Status Species in the Arizona HDMS, listed alphabetically by county, by taxon, by scientific name.

Updated April 2005

COUNTY	TAXON	SCIENTIFIC NAME	COMMON NAME	ESA	BLM	USFS	STATE
Coconino	PLANT	Penstemon nudiflorus	Flagstaff Beardtongue			S	
Coconino	PLANT	Petalonyx nitidus	Shiny-leaved Sandpaper Plant		S		
Coconino	PLANT	Phacelia serrata	Cinder Phacelia	SC			
Coconino	PLANT	Phacelia welshii	Welsh Phacelia	SC			
Coconino	PLANT	Pinus aristata	Rocky Mountain Bristlecone Pine				SR
Coconino	PLANT	Platanthera zothecina	Alcove Bog-orchid	SC			
Coconino	PLANT	Polemonium flavum	Pinaleno Jacobs Ladder			S	
Coconino	PLANT	Primula specuicola	Grand Canyon Primrose				SR
Coconino	PLANT	Psorothamnus thompsonae var. whitingii	Whiting Indigo Bush	SC			
Coconino	PLANT	Puccinellia parishii	Parish Alkali Grass	SC			HS
Coconino	PLANT	Rosa stellata ssp. abyssa	Grand Canyon Rose	SC	S	S	SR
Coconino	PLANT	Rumex orthoneurus	Blumer's Dock	SC		S	HS
Coconino	PLANT	Sclerocactus sileri	House Rock Fishhook Cactus				SR
Coconino	PLANT	Senecio franciscanus	San Francisco Peaks Groundsel	LT			HS
Coconino	PLANT	Shepherdia argentea	Silver Buffaloberry		S		
Coconino	PLANT	Silene rectiramea	Grand Canyon Catchfly	SC			
Coconino	PLANT	Talinum validulum	Tusayan Flame Flower	SC			SR
Coconino	PLANT	Thelypteris puberula var. sonorensis	Aravaipa Wood Fern		S		
Coconino	PLANT	Triteleia lemmoniae	Mazatzal Triteleia				SR
Coconino	PLANT	Yucca whipplei	Our Lords Candle				SR
Coconino	PLANT	Zigadenus virescens	Green Death Camas				SR
Coconino	REPTILE	Crotalus oreganus abyssus	Grand Canyon Rattlesnake			S	
Coconino	REPTILE	Thamnophis eques megalops	Northern Mexican Gartersnake	SC		S	WSC
Coconino	REPTILE	Thamnophis rufipunctatus	Narrow-headed Gartersnake	SC		S	WSC
Gila	AMPHIBIAN	Bufo microscaphus	Arizona Toad	SC		S	
Gila	AMPHIBIAN	Eleutherodactylus augusti cactorum	Western Barking Frog			S	WSC
Gila	AMPHIBIAN	Rana chiricahuensis	Chiricahua Leopard Frog	LT		S	WSC
Gila	AMPHIBIAN	Rana yavapaiensis	Lowland Leopard Frog	SC		S	WSC
Gila	BIRD	Accipiter gentilis	Northern Goshawk	SC		S	WSC
Gila	BIRD	Asturina nitida maxima	Northern Gray Hawk	SC	S	S	WSC
Gila	BIRD	Buteogallus anthracinus	Common Black-Hawk			S	WSC
Gila	BIRD	Ceryle alcyon	Belted Kingfisher				WSC
Gila	BIRD	Coccyzus americanus occidentalis	Western Yellow-billed Cuckoo	C		S	WSC

APPENDIX C

TURNOUTS TO BE ELIMINATED

TURNOUTS TO BE ELIMINATED

Turnout	Milepost	Station
Wupatki Basin / Painted Desert Overview Turnout	23.7	1252+10
Gravel Turnout	24.1	1275+05
Gravel Turnout	25.6	1352+92
Gravel Turnout	25.9	1366+66
Gravel Turnout	25.9	1368+99
Gravel Turnout	26.4	1391+47
Gravel Turnout	26.9	1419+80
Gravel Turnout	28.0	1475+95
Gravel Turnout	28.5	1506+03
Gravel Turnout	28.7	1516+40
Gravel Turnout	28.8	1520+00
Gravel Turnout	28.9	1528+75
Gravel Turnout	29.1	1535+10
Gravel Turnout	29.4	1553+57
Gravel Turnout	29.5	1557+28
Gravel Turnout	29.8	1572+57
Doney Wash Turnout	30.4	1603+74
Gravel Turnout	30.5	1611+38
Gravel Turnout	30.6	1613+22
Gravel Turnout	30.6	1613+81
Gravel Turnout	31.1	1639+33
Gravel Turnout	31.3	1654+42
Gravel Turnout	31.6	1668+63
Gravel Turnout	31.9	1684+51
Gravel Turnout	32.2	1698+22
Gravel Turnout	32.6	1719+88
Gravel Turnout	33.9	1792+22
Gravel Turnout	35.3	1863+51
Gravel Turnout	35.5	1872+99

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.

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